American Druggist and Pharmaceutical Record.

A JOURNAL OF PRACTICAL PHARMACY.

VOL. XXIII. No. 4. NEW YORK, JULY 27, 1893. WHOLE No. 257

AMERICAN DRUGGIST PUBLISHING COMPANY.
37 COLLEGE PLACE, NEW YORK.
A. R. ELLIOTT, PRESIDENT.

Subscription Price—For the United States and Canada, - $2.00
If paid in advance direct to this office, 1.50
" " for Foreign Countries, - - - - 2.50
Single Copies, - - - - - - - - - - .15

The "American Druggist and Pharmaceutical Record" is issued on Thursday of each week. Changes of advertisements and all copy for publication should be received before Tuesday of each week.

We are not responsible for any money paid to agents. All remittances should be made direct to this office. Express Orders, Post-Office Orders and Drafts on New York should be made payable to the "American Druggist Publishing Company" and addressed to them at 37 College Place, New York.

Liberal Commissions to Club Agents.

TO THE COLUMBIAN EXPOSITION.

THE schedule of the special A. P. A. excursion from Boston, New York, Philadelphia, Baltimore, Washington and intermediate points, has been slightly modified since our last issue and reads now as follows:

Leave Boston and the East as convenient, stop over privilege in New York.

Leave New York, Liberty street Friday, August 11 at 11 P.M.: arrive in Washington the 12th, at 6.30 A.M. Leave Philadelphia per special sleeper on regular train Chestnut and Twenty-fourth streets, August 12 at 8.15 A.M., Wilmington, 8.45 A.M. and Baltimore at 10.20, arriving at Washington at 11.35. The whole party will leave at 1 P.M., arriving in Chicago on Sunday.

NOSTRUMS ON THE WANE.

THE patent medicine trade is in a bad way. This is evinced by the failure of an old patent medicine concern in this State which it is said has collapsed because the sales were not sufficient to pay the salaries of the officers. The other evidence of the shaky condition of the industry referred to is found in the prevailing distress among patent medicine firms which have long withstood the effects of financial stringency, substitution by druggists, and the countless other ills which affect the patent medicine body politic.

One of the most honest and straightforward critiques on the growth and development of nostrums is given by the editor of the *Shipping and Commercial List:* "All patent medicines," he remarks, "good, bad and indifferent, are started on the road to success by proper advertising and it seems necessary to continue that policy if profits are to be earned." And again: "It is not so much a question of merit as of publicity. When not before the public eye constantly or at intervals a nostrum is soon forgotten and something else takes its place." This may not prove pleasant reading to *Printers' Ink* and its numerous progeny who are such earnest and public apologists of the nostrum dealers and manufacturers, but it is nevertheless very near to the actual truth, and we hardly think it will be possible to find a *Richardson* Quixote foolhardy enough to endeavor to lessen its force.

PHARMACEUTICAL ANNEXATION.

THE Pharmaceutical Association of the Province of Quebec is sounding the pharmacists of the other Provinces as to the feasibility of organizing a general Canadian pharmaceutical association and of issuing under its auspices a Canadian Pharmacopœa. One of the immediate causes for this move is that prosecutions have been brought for adulteration without recognizing the fact that the only fault has been a misapprehension on the part of the dispenser as to whether the British, the French, or the United States Pharmacopœia should have been recognized as the authority in the preparation of the particular galenical in question.

While we must admit that some advantages may be gained by having a Canadian Pharmacopœia we scarcely think that those advantages would be commensurate with the expenditure of time, effort and money involved in its preparation. Rather let our friends "over the border" adopt the United States Pharmacopœia.

This work more than any similar one is catholic in its scope being adapted, as it is, to minister to the wants of sixty millions of people of almost every race and country, who have come to make their home within the three and a half million square miles of these United States.

In a large portion of Canada the United States Pharmacopœia is the generally accepted standard and it would be but a single step, and that a step in advance, to have it officially recognized by the several Provincial Parliaments just as it has been by a number of the States of the Union.

As to a national association it would no doubt do much good, but our Canadian confreres should remember that the A. P. A. is an *American* not simply a United States association.

THE FAIR AS AN EDUCATOR.

JOURNALISTS of all shades of opinion and belief have united in bearing willing testimony to the importance of the World's Fair as a great factor in the education of the people. Visitors competent to judge and express opinion have declared that, time and place taken into account, the Fair has never been equalled in respect of the influences toward higher conceptions of science and art, which exhibitions of its kind undoubtedly exert on all who are privileged to visit them; and it is being borne in upon everyone that, provided proper advantage is taken by exhibitors of the splendid opportunities at their disposal, all the arts and industries will alike be permanent gainers by this the grandest and most successful anniversary commemoration ever achieved by a civilized people.

An erroneous impression is generally current with the public in regard to the cost of medicines, and some good educational work might be accomplished by the various exhibitors of chemico-pharmaceutical products if they would affix labels to the large containers of rare chemicals, giving in plain figures the approximate cost of the drugs in grains, ounces and pounds. The public would then be less apt to grumble about druggists' charges since they would be likely to have a better knowledge of the true cost of drugs, and a greater respect for the skill of the pharmacist.

MAKE THEM YOURSELF.

OF all the various plans proposed for doing away with the evil of cutting prices on proprietary medicines the one which has met with the largest measure of success is that of "making them yourself."

It is true that this method has wrought relief only in individual cases but this is inherent in the very nature of things. It is an individual remedy for an individual evil, but had this individual remedy been generally applied twenty or even ten years ago the cry of "cut prices" would have caused no serious alarm.

An able and intelligent pharmacist of this State in discussing the commercial outlook at the last meeting of the New York State Association said: "Personally I am doing well despite the dull times and I attribute my prosperity to the change of policy which has led me to make my own proprietaries and pharmaceuticals whenever possible. I feel confident however, that, had I adopted twenty years ago the policy I now pursue I would be in very much better circumstances."

It is with a view to aiding our readers to follow the example of this prosperous pharmacist that this journal has spent so much money and time in securing and publishing the most approved practical and valuable formulas for the preparation of pharmaceutical specialties.

The paper presented this week under the title of "How to make them yourself," is a valuable contribution toward the knowledge of how to go about this work to the best advantage and we hope that the information may be utilized by many of our readers, and that its use may bring them increased gain.

It must not be supposed, however, that in commending to the special attention of our readers this means of combatting the cutting evil we mean to ignore the broader methods which lie within the scope of organization to utilize.

The improvement in musketry does not do away with the usefulness of artillery, and in this warfare no armor tactics should be neglected which promise honorable victory.

PRACTICAL PHILANTHROPY.

CONSIDERABLE newspaper space was devoted to the suit brought by a physician of this city to recover an unusually large fee some months ago, but in the discussion of the justice or injustice of the charge one phase of the question was given little if any prominence, and this is the amount of charity work done by physicians.

In the larger cities where there are hospitals, dispensaries, etc., the profession give their services as visiting and consulting physicians to these institutions, in the large majority of cases, without any remuneration whatever. In the rural districts in the absence of organized charity each physician is called upon to and does devote a not insignificant portion of his time to the care of people from whom he can never hope to receive any remuneration. It is by charging apparently high prices for the services rendered the wealthy that the physician is enabled to devote so much time to charity work and still earn a livelihood.

A similar state of affairs exist, in pharmacy, though since the demands of charity are not so exacting the charges of the pharmacist to the wealthy are not so much out of proportion to the charges made to the indigent as are those of the physician.

In the cities a charity tax is indirectly levied upon the pharmacist by the practice of the dispensaries of eleemosynary institutions furnishing medicines either free or at a merely nominal price. If this attendance and medicine were furnished to paupers only, neither physicians nor pharmacists would be the losers; but, as was pointed out in the article on the dispensaries of New York, which appeared in these columns some weeks since, a large number of these dispensary patients are far from being proper objects for the bestowal of charity, since they are well able to pay for the service and medicine furnished. It may be that the necessity of having an abundance of clinical material at hand renders less keen the discrimination against the well-to-do, which should be exercised in the public dispensary.

Being able to procure medicines either free or at a merely nominal price at the dispensary, the patients naturally do not give the pharmacist any prescription business, thus cutting off one of the most profitable branches of his custom and levying an involuntary contribution to what is in too many cases an undeserved charity.

Aside from this indirect tax on the pharmacist there is a direct tax in the *p. p.* of the physicians, who, stumbling on some deserving poor outside the dispensary service, vouches to the pharmacist by his *p. p.* on the prescription that the patient is in real want, a genuine *poor patient.* This sign on a prescription when put in good faith is, we feel confident, never disregarded by the dispenser.

These special demands of his calling are met by the pharmacist cheerfully and promptly, but to do so it is necessary, in justice to his own family, for him to charge a sufficiently high price to the wealthy to maintain the average of his charges on a living basis. More might be made of this view in the inevitable argument as to prices which is forced upon the pharmacist by so many of his customers.

This view of charity may seem sordid and narrow at first sight, but a little consideration will show that it merely reflects the basis upon which any charity involving pecuniary, not bodily, aid is based. It is by the toil of the many that the few grow wealthy, and the possession of the gift which enables him to rise above his fellows imposes an obligation on the successful man to share the burdens of the poor. This he does in various ways, his direct contributions to charity being, in many cases, the least important of them, while the largest share of his contributions are made in the higher price, which he pays for service of all sorts, including that of the pharmacist and of the physician.

THE SALE OF INTOXICANTS.

WHAT has been for long a subject of reproach among the more ethical-minded of the pharmaceutical profession is the disposition of some pharmacists to embark on the flimsiest of excuses in the sale of alcoholic stimulants. This is to be observed in all large cities despite the regulations which have been drawn up for its restriction to the persons in whose hands the traffic properly belongs; and the existence of establishments which to the public eye appear as pharmacies and in nowise different from stores doing a legitimate business save in the surreptitious sale of intoxicants, is a serious reflection on the whole profession. The recent enactment in this State of laws having for their object the closer restriction of the sale of intoxicating liquors to saloon keepers cannot be regarded as other but a step in the right direction, and this notwithstanding the fierce protests which the measure has called forth from interested parties. For these very protests, based on the mistaken notion that the rights of the retail druggist had been invaded and that druggists were to be no longer allowed to dispense liquors ordered as the component ingredients of prescriptions, only went to prove the necessity which existed for legislation of this kind. The fact, too, that the measure was brought forward by the saloon-keeping element as a means of defending themselves against what was termed "competition from druggists" was also fair evidence of the need which called it forth.

We have referred in these columns on other occasions to the Chicago method of dealing with the sale of alcohol and intoxicating liquors by druggists, and have expressed the conviction that were the law properly enforced the ordinance would prove most beneficial to pharmacists and the public generally. On comparing the Chicago ordinance with the laws affecting the sale of intoxicants by pharmacists in this State, it will be seen that no great difference exists between them. Both are intended for the prevention of the indiscriminate sale of liquors and of any illegal diversion of moneys belonging properly to the State as State taxes.

Going farther afield than New York or Chicago we find in Iowa—noted for its prohibition tendencies—a state of affairs which may well be termed deplorable. For there we have every evidence that the peculiar form of law by which the State is governed in this regard is almost powerless to accomplish the chief end of its creation, *viz.*, the restriction of the liquor traffic. The licensed saloon has been abolished, it is true, but only to appear in another form. In its place has appeared a drug store,—so called, the proprietor of which is only rarely a licensed pharmacist or one who might lay claim to a knowledge of pharmacy. The simple fact, and we say it without intending to reflect on the merits of the Iowa Board of Pharmacy Commissioners, which is a most efficient body, is that men are allowed to become *de facto* proprietors of pharmacies who would not be recognized as such by the law.

Notwithstanding an occasional observation to the contrary, it may be said with truth that no class is more jealous of its fair fame than pharmacists. They may not have the *esprit de corps* which distinguishes the medical profession, but this comes of the rivalry which is almost unavoidable from the commingling of the commercial with the professional aspects of the calling, conditions which we have good reason to believe will become less apparent as times goes on and pharmacists come to have a fuller knowledge each of the other as well as of the advantages which come from a leveling of the petty jealousies which bar the way to successful organization. Were organization more perfect and the powers of pharmacy boards less limited, it is needless to say that the imputations on pharmacy and pharmacists which we are treated to with such frequency by the daily press of nearly all the prohibition States from Maine to Kansas, would become less and the status of the profession correspondingly elevated. The history of pharmacy in this country is a continuous record of progress toward a higher conception as to the responsibilities of the individual pharmacist, and the natural sequence has been a collective increase of respect on the part of the community for the pharmacist and his avocation. When this comes to be more fully recognized it may be that our solons will appreciate the fact that *development* comes through responsibility, and that it is only by making pharmacists themselves responsible for the proper carrying out of the laws that success in the direction of securing their proper execution will be assured.

Written for the American Druggist and Pharmaceutical Record.

HOW TO MAKE THEM YOURSELF.

By Galen, Jr.

At this time, when there is such a hue and cry being raised against patent medicines, it may be well to consider means of overcoming the evil. It cannot be denied that the evil is a crying one, but extreme or intemperate utterances are nevertheless uncalled for. The fact that abuse is not argument and that many statements have frequently no foundation in fact should not be lost sight of. The pharmacist has much to contend with, and among the greatest is the continual production of new medicines and the ruinous cutting of prices. The people who use patent medicines will buy them some where, and if the pharmacist wishes to hold trade he will of course have to keep them in stock. How can he make their sale harmonize with his interests? What is the best course to pursue to mitigate the patent medicine nuisance? Shall he buy non-secrets and endeavor to sell them in the place of the proprietary goods? Or shall he put up a line of goods himself and replace articles from the sale of which he derives no legitimate profit? Neither of the above will in the opinion of the writer be found profitable. Again, this course is not doing justice to the many upright and good business firms who have spent both their time and money to create a demand for the articles of their manufacture; and such a course would be likely to work more harm than benefit.

Again many pharmacists think that any patched up formula will do. They seem to forget that behind these patents are many men of brain and ability and that such men have more sense than to attempt to force a sale on goods having no merit, or if having merit, but very little. The pharmacist will find that in order to replace patent and proprietary medicines with those of his own manufacture that he must at least equal them in merit and also in appearance. The writer does not wish to be understood as favoring patents. On the contrary he believes that the druggist can replace the goods to a large extent with preparations of his own; but he believes that first and foremost of all, he should possess reliable formulas. He must put the goods up in presentable shape and at first confine his efforts to a limited line and gradually extend the number. If having a superior preparation he sells it to a customer to whom it gives satisfaction or benefits, it will nine times out of ten prove a good advertisement since that customer will take pains to recommend it to others. Every druggist has a demand for a good blood remedy or cough cure, and to satisfy this he may offer his own goods and harm no one if they fail to effect a cure. The formulas offered below have had the advantage of extended trial and have proven good. The writer does not claim that they are better than others, but he is confident that they will afford good reliable preparations if directions are carefully followed.

Headache Remedies.

Headache remedies have come to be staple proprietary medicines in every pharmacy. They are found in the market as wafers, capsules, powders and caffervescent salts.

Most, if not all of them, contain acetanilid and caffeine. The following formulas are easily prepared and furnish excellent preparations of their kind.

HEADACHE POWDERS.

Acetanilid	3 grains
Caffeine	½ grain
Bicarbonate soda	3 grains

Mix thoroughly.

This makes one pill or powder or wafer, as the dealer may choose to make it.

Acetanilid	3 grains
Salicylate soda	3 grains
Caffeine	½ grain

Mix. Make one capsule or wafer.

Acetanilid	3 grains
Salicine	4 grains
Caffeine	½ grain

Mix. Make in capsule or wafer.

This makes a very efficient remedy, but it is bitter to the taste and should be dispensed as a wafer or capsule.

BROM-ACETANILID AND CAFFEINE.

Bromide potassium	200 grains
Caffeine	20 grains
Acetanilid	60 grains
Bicarb. soda	600 grains
Tartaric acid	540 grains
Sugar	440 grains

All the substances should be thoroughly dried and intimately mixed; then moistened with alcohol and rubbed through a No. 12 sieve and dried thoroughly.

Each heaping teaspoonful contains about 10 grains bromide potassium, 3 grains acetanilid, and 1 grain caffeine. The above headache remedies are fairly representative of the preparations in the market and will be found very efficient.

Blood Purifiers.

One of the patents most easily sold by the dealer is a good blood remedy. Any one of the following will be found to be excellent. They are easily prepared, and afford agreeable preparations.

COMPOUND SYRUP SARSAPARILLA AND STILLINGIA.

Red clover	6 ounces
Stillingia	8 ounces
Sarsaparilla	8 ounces
Prickly ash bark	2 ounces
Licorice	3 ounces
Coriander	1 ounce
Anise	1 ounce
Wintergreen	1 ounce
Senna	4 ounces
Iodide potass	3 ounces
Alcohol 33⅓ per cent. a sufficiency.	

Percolate the coarsely powdered drugs after macerating for 12 hours with 33⅓ per cent. alcohol until 6 pints are obtained, then dissolve 4 lbs. sugar in this by agitation; lastly add the iodide of potassium and dissolve.

SYRUP RED CLOVER COMPOUND.

Red clover	8 ounces
Stillingia	4 ounces
Berberis aquifolia	2 ounces
Prickly ash berries	1 ounce
Burdock root	4 ounces
Poke root	1 ounce
Sarsaparilla	4 ounces
Iodide potass	2 ounces
Oil wintergreen	30 drops
Alcohol 33⅓ per cent. a sufficiency.	

After 12 hours' maceration percolate the powdered drugs to 5 pints. To 6 lbs. sugar add the oil of wintergreen, add the iodide of potassium to the percolate, dissolve sugar by percolation and make up to 1 gallon with simple syrup.

COMPOUND SYRUP STILLINGIA AND YELLOW DOCK.

Stillingia	8 ounces
Yellow dock	8 ounces
Senna	4 ounces
Prickly ash bark	2 ounces
Licorice	3 ounces
Burdock	4 ounces
Coriander	1 ounce
Anise	1 ounce
Wintergreen	1 ounce
Iodide potass	2 ounces
Alcohol, 33⅓ per cent. a sufficiency.	
Sugar	4 lbs.

After macerating the properly ground drugs with 33⅓ per cent. alcohol for 12 hours, percolate to 6 pints, add the iodide of potassium and sugar to the percolate, dissolve by agitation and make up to 1 gallon with simple syrup.

Cough Cures.

Another class of remedies that are ready sellers are cough syrups. With a good formula, a pharmacist should have no trouble in making a ready sale. The following formulas are offered, which have proved very satisfactory in the writer's own experience :

SYRUP WHITE PINE COMPOUND.

Balm Gilead buds Spikenard Blocd root, aa	5⅓ ounces
White pine	20 ounces
Wild cherry	40 ounces
Ipecac	4 ounces
Sassafras	2⅔ ounces
Acetate morphine	2 drams
Chloroform	5⅓ ounces
Alcohol, 1 part } Water, 2 parts }	q. s.

After 12 hours' maceration of drugs reduced to coarse powder, percolate with above menstruum to 24 pints. In this dissolve 24 lbs. sugar by percolation and add ½ gallon confectioner's glucose. Dissolve morphine in 8 ounces of water and add sufficient acetic acid to remove turbidity. Mix with syrup, add the chloroform and agitate well; add lastly enough simple syrup to make 40 pints.

This formula is a modification of the Syrup White Pine compound of the manufacturing pharmacist, and is a very efficient preparation. If combination with tar is thought desirable, ½ ounce of N. F. glycerite of tar can be added to each pint.

SYRUP WILD CHERRY COMPOUND.

Wild cherry	16 ounces
Spikenard	4 ounces
Ipecac	3 ounces
Blood root	1 ounce
Tinct. opium	4 ounces
Alcohol, 1 part } Water, 2 parts }	q. s.

Macerate 12 hours and then percolate to 5 pints. Add the tincture opium and filter; then dissolve 6 lbs. sugar in filtrate by percolation and add enough simple syrup or glycerin to make one gallon. Tar can be added, if desired, as in the preceding formula :

COMPOUND SYRUP OF TAR.

Fluid extract of licorice	2 ounces
Tinct. opium camphorat	2 ounces
Syrup ipecac	2 ounces
Glycerite tar, N. F.	½ ounce
Syrup tolu, enough to make one pint.	

By using one-half the quantity of liquid extract of licorice made according to formula published recently in the PHAMACEUTICAL RECORD, a much nicer preparation can be obtained.

Liniments.

The pharmacist is often called on for a good embrocation or liniment.

The following, which is for external use only, will be found to answer in most cases:

HOME LINIMENT.

Cottonseed oil	8 ounces
Oil wintergreen	½ ounce
Turpentine	3 ounces
Chloroform	1 ounce
Aqua ammonia	3 ounces

This furnishes an excellent embrocation. The wintergreen may be replaced with any suitable aromatic oil, such as rosemary, cedar or thyme. For a liniment that can be used externally or internally the following formula is offered:

PAIN EXPELLER.

Oil sassafras	8 ounces
Oil cassia	1 ounce
Oil cloves	2 ounces
Turpentine	6 ounces
Stronger ammonia	1 ounce
Chloroform	4 ounces
Alcohol enough to make	1 gallon

RHEUMATIC LINIMENT.

Oil sassafras	6 ounces
Oil thyme	1 ounce
Oil cedar, pure	1 ounce
Oil wintergreen	4 ounces
Camphor	8 ounces
Turpentine enough to make	1 gallon

Salves.

The following formulas are offered as the equal of any of the patent salves. They are easily made and very profitable.

BALSAMIC CARBOLIC SALVE.

Carbolic acid	2 drams
Oxide zinc	3 ounces
Resin	½ ounce
Beeswax	1 ounce
Balsam fir	1 ounce
Camphor	1 ounce
Lard enough to make	1 lb.

Melt lard and in this dissolve the camphor; add the resin and beeswax, then the balsam and carbolic acid. Lastly sift in the oxide of zinc and stir until cool.

EYE SALVE.

Yellowoxide mercury	8 grains
C. P. oxide zinc	16 grains
Morphine sulphate	4 grains
Petrolatum	1 ounce

Mix.

This forms an excellent eye salve.

BLACKBERRY CORDIAL.

For a blackberry cordial the writer has nothing better to offer than the following taken from Fenner. It is an agreeable preparation and very efficient.

Blackberry juice	4 pints
Catechu	4 ounces
Cinnamon	1 ounce
Nutmegs	1 ounce
Coriander seed	1 ounce
Opium in powder	¼ ounce
Sugar	2 lbs.
Alcohol	2½ pints
Water enough to make	1 gallon

Grind drugs to fine powder and macerate them for a week with the juice and alcohol; then filter; add sugar and dissolve by agitation; lastly add water or simple syrup to make 1 gallon.

The writer does not recommend pharmacists to put up a full line of remedies at once, but to put up two or three and be sure they are first class and then gradually extend his line as occasion and trade demand. I have not taken space to give directions for these different formulas, as any intelligent pharmacist can get up suitable directions, which, by the way, should be explicit and very plain.

Iodine and Tannin.—It is well known that iodine will dissolve in solutions of tannin, but in what proportions? The *Journal de Pharmacie d'Anvers*, according to the *National Druggist*, discusses the following prescription, which was presented recently for preparation :

Iodine	25 cgm.
Potassium iodide	1 gm.
Tannin	2 gm.
Potassium bromide	10 gm.
Distilled water	50 gm.
Glycerin	150 gm.
Essence of mint	20 drops

At first thought one would proceed to compound this prescription by pulverizing the four solids and mixing them; then mixing the water and glycerin, and dissolving therein the mixed solids. This process would appear rational, since the iodide, the bromide, and the tannin are all soluble in water, and the iodine is soluble in solutions of potassium iodide and of tannin. If manipulated in this way, however, a liquid will be obtained from which the iodine will separate completely. After experiment it was found necessary, in order to achieve success, to mingle the iodine, iodide and tannin intimately, and then to add the distilled water. Solution takes place in about two hours. When solution is completed bromide is dissolved in the liquid, the glycerin added, and, finally, the essence of mint. Without the latter the solution is of a fine, limpid, brown color, which the essential oil renders slightly turbid.

Written for the American Druggist and Pharmaceutical Record.

LACTIC ANHYDRIDE, LACTIDE AND LACTONE.

By Virgil Coblentz, A.M., Ph.G., Ph.D.,
New York College of Pharmacy.

In the Druggist and Record of June 22, I wish to call attention to a slight error or oversight in the article of Prof. Scoville on the titration of lactic acid, on page 384. It reads thus:

"The acid thus obtained is of a syrupy consistence and has a specific gravity of 1.21 to 1.24 and consists of a mixture of true lactic acid and *lactic anhydride*—the latter being formed by heat of evaporation, even in presence of the small amounts of water present.

"This anhydride is formed by elimination of one molecule of water from two molecules of acid, and is called *lactic anhydride*, *lactolactic acid* or a *lactone*.

$$2HC_3H_5O_3 - H_2O = HC_3H_5O_3, C_3H_4O_2."$$

Here the author confuses the terms "lactic anhydride" and a "lactone" as being one and the same thing. This is not the fact, as will be seen:

On evaporating, distilling or even allowing lactic acid to stand over sulphuric acid some time, for purpose of removing water, either *lactic anhydride* or *lactide* or both together are formed in small quantities. Thus the loss of one molecule of water from two of acid

$$\begin{matrix} CH_3-CH & \{OH \} & -COOH \\ | & \{\ \ H \} & -COOH \\ CH_2-CHO & & \end{matrix} =$$

$$= H_2O + \begin{matrix} CH_2-CH-COOH \\ \quad\quad >O \\ CH_2-CH-COOH \end{matrix}$$

gives rise to *lactic anhydride*, $C_6H_{10}O_5$.

The loss of two molecules of water from two of acid

$$\begin{matrix} CH_3-CH & \{OH \} & -CO & \{OH \} \\ CH_2-CHO & \{\ \ H \} & -COO & \{\ \ H \} \end{matrix} =$$

$$= 2H_2O + \begin{matrix} CH_2-CH-CO \\ \quad\quad >O \quad >O \\ CH_2-CH-CO \end{matrix}$$

gives rise to *lactide*, $C_6H_8O_4$.

Now a word of explanation as to what is meant by the term, "*a lactone*." Lactones are intra-molecular anhydrides (*i.e.*, one molecule of acid minus one molecule of water) of the oxyacids (γ-δ).

Ordinary lactic acid is an *oxy*-propionic acid, of which there are two possible isomerides:

$CH_3 - CH_2 - COOH$ propionic acid, $CH_3 - CH(OH) - COOH$ is $\begin{cases} \alpha \text{ oxy-propionic or} \\ \text{ordinary lactic acid.} \end{cases}$

$CH_2(OH) - CH_2 - COOH$ is $\begin{cases} \beta\text{-oxy-propionic acid or} \\ \text{hydracrylic acid.} \end{cases}$

From normal butyric acid three isomerides are possible, thus: $\overset{\gamma}{CH_3} - \overset{\beta}{CH_2} - \overset{\alpha}{CH_2} - COOH$, and so on with the higher acids.

Now the γ and δ oxy-acids are especially adapted to this lactone formation, thus:

$$\begin{matrix} CH_2-CH_2-OH \\ | \\ CH_2-COOH \end{matrix} \quad - H_2O = \quad \begin{matrix} CH_2-CH_2 \\ | \quad\quad >O \\ CH \ -CO \end{matrix}$$

γ-Oxy butyric acid — γ-Butyrolactone.

Some of the β oxy-acids are capable of yielding corresponding lactones, but the existence of an α lactone (from α -oxy-acids) is very doubtful. (Ber. 15-579.)

Professor Scoville's View on the Subject.

The above article was submitted to Prof. Scoville, with a request for his views. Prof. Scoville writes:

Professor Coblentz is undoubtedly right in holding that the term "lactone" is the proper one from a technical standpoint. I used the term anhydride in my article because of its being better understood by the general reader, and also because the term is often applied to the lactones.

Authority for this may be found in "Thorpe's Dictionary of Applied Chemistry, Vol. II., article 'lactic acid,'" the author of which I am unable to quote at this time, being away from Boston.

In regard to the formation of lactone in ordinary lactic acid, I can only say that the peculiar action of the acid in absorbing water is, to me, sufficient evidence of its presence, not to quote the article in Thorpe's Dictionary in which this ground is also taken.

Whether ordinary lactic acid belongs to the α or β groups, or whether it is really formed from an *a* acid, I am not prepared to state.

I desire to thank Professor Coblentz for his interest in the matter, and hope that he and others will further investigate this reaction and its true causes.

Wilbur L. Scoville.
Massachusetts College of Pharmacy.

INSECTS INJURIOUS TO DRUGS.*

By Professor L. E. Sayre, Ph.G.,
University of Kansas, Lawrence.

A knowledge of entomology to the average pharmacist has always been considered of little more value than an ornamental accomplishment, having little more application than the scientific classification and naming of the few drugs derived from the insect world. To give these proper entomological names and understand in some degree their relations to other insects and the relations of the groups to which they belong to other groups has been all that was deemed necessary for the pharmacist to know of this department of scientific study.

It needs little argument to prove that a more intimate study of insects is not only useful but is almost as essential to those who are supposed to discover the cause of deterioration and to be able to combat the same intelligently. This knowledge should extend to the insect forms which infest and feed upon drugs and their preparations, as the mites and dermestid beetles and forms which prey upon the drug-eating species. This, it may be said, embraces a very limited range in the eyes of the entomologist, but an acquaintanceship with this much of the science should be, for very practical purposes, well understood.

It is not my purpose in the subjoined article to treat of the science, *per se*, or to go into any lengthy detail as to the study of drug-eating insects as has been carried on in the entomological department of the University of Kansas. An article by Prof. V. L. Kellogg and myself, describing the work of last year, will be found in the proceedings of the Kansas Pharmaceutical Association for 1892. Since this time, Prof. Kellogg and Mr. S. J. Hunter have continued this study, to whom I am indebted for the material contributed upon the subject at the last meeting of this association. I shall in this article briefly glance at the various insects themselves found in various drugs and make some comments upon them for the better understanding of them.

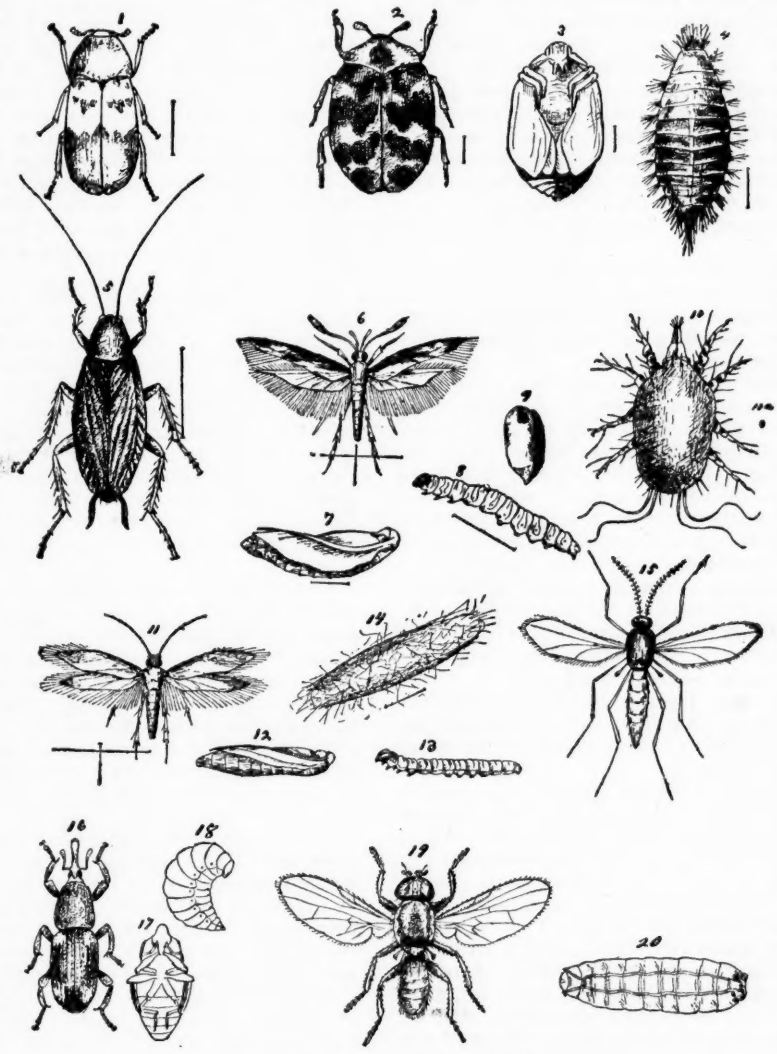
Referring now to Plate I., I will call attention to Fig. 10. The natural size of this *mite* is found in Fig. 10a. This is the common cheese, or flour mite, familiar to most of us, found in farinaceous drugs. The order to which it belongs—the mites—are characterized by having most of the mouth parts united to form a piercing beak. They have two sharp needle-like projections.

* From the *American Journal of Pharmacy.*

which correspond to the jaws or mandibles of other insects. These stylets or lancets are very useful when the mite needs to pierce some protecting envelope to get at succulent inner matter, or when the mite has to live on "dry food." This mite species lives on raw sugar, in which it appears as small white specks. At least a half dozen species of mites attack cantharides, which, we know, are insects belonging to the great beetle order. Besides the mites, several species of small animal eating beetles do great havoc in the jars of cantharides. The beetles of the dermestid family, to which belongs the well-known buffalo bug, or moth of the household, feed almost exclusively on the dried remains of animals; at least this is their food when in the young or grub state. Right here it may be well to interpose a few remarks upon certain peculiarities in the life history of insects, the knowledge of which is essential to the intelligent comprehension of the subject in hand.

While in certain groups of insects the young when hatched from the egg (and insects are hatched from eggs, almost without exception) resemble the parents, the adults, yet, in other groups or orders, as the beetles, the two-winged flies, the butterflies and moths, and the ants, bees and wasps, the young appear in wholly different form from that which they will assume when full grown. For example, in the beetles, you remember, we had come to the consideration of certain cantharide-eating beetles, the first stage after leaving the egg is that of a grub or worm, so called. This worm like stage is called the *larval* stage, and the insect itself a *larva*. In the case of the dermestid beetles, of which several kinds infest the cantharides, the larva is a peculiarly hairy grub, well shown in the accompanying plate. The dermestid beetle here illustrated in its various stages of growth is the buffalo bug, and in Fig. 4 is the "fish"-shaped larva with its hairy body, next the mummy-like pupa (Fig. 3), with its legs and feelers closely folded against its body. This is the second stage in the life of the beetle. After the larva has become full grown it seeks a sheltered spot, ceases feeding, and becomes transformed into an almost immovable mummy-like object, called the pupa. It remains thus quiet and without eating for a few weeks (in most cases), and then emerges, the perfect beetle Fig. 2.

There are other species of beetle which attack the pharmacist's stores; for example, *Ptinus brunneus* (we are sorry to be compelled to use these scientific names, but very few insects have common names), a small brown, slender legged beetle, which feigns death when disturbed, does great havoc in the larval stage, in jars of allspice, capsicum and cinnamon. *Anobium paniceum*, one of the so-called "death ticks," and much like the Ptinus, attacks agaric and several other drugs. *Lasioderma serricorne*, closely related to the *Anobium* and *Ptinus* (all belonging to the family Ptinidæ), eats, as larva, capsicum and dried tobacco. *Bostrichus dactilliperda*, another member of the same family, attacks sweet almonds. Two species of *Deutorhynchus*, small, snouted beetles or weevils, infest poppy and other seeds. Another weevil, *Dalandria oryza* (Figs. 16, 17, 18), imported from Europe, infests rice and ground roasted acorns. A near relative is the notorious grain weevil, which does great damage to stored cereals.



INSECTS INJURIOUS TO DRUGS.

Leaving the beetles now, the next group of insects important to the pharmacist is that of the moths and butterflies. While we should hardly expect to find moths and butterflies with their long nectar-sucking tubes for mouths, injuring our stores, we do find that these same insects in their young or larval stage, when they are familiar to all as "caterpillars," do not a little injury to our drugs.

The moths, like beetles, go through a strange metamorphosis, and while in the caterpillar stage are provided with strong jaws for eating dry food. All know of the clothes-moth, dread foe of the housewife, which, as a small white caterpillar, living in a cylindrical roll

or case made from the woolen cloth or fur it is feeding on, does irreparable injury to the choicest fabrics and costliest furs. This moth belongs to the genus *Tinea*, of which one or more species attack drugs. Figs. 11, 12, 13, 14 illustrate the life history of the moth of this genus. Fig. 13 is the larva or caterpillar, Fig. 14 the case or roll in which it lives; Fig. 12 is the pupa or resting stage, and Fig. 11 is the adult moth. The moth is very small and light brown in color. Another moth, known as the Angoumis grain moth (it does great havoc to stored grain in the province of Angoumois, France; hence the name), attacks in the caterpillar stage all kinds of stored grain. It bores holes into the grain kernels and eats out the starchy interior, leaving only a delusive hollow shell. The illustrations Figs. 6, 7, 8, 9 show its various stages and the appearance of the infested grain kernels. The larva of *Carpocapsa amflana*, a moth of the same genus as the codlin moth, the greatest insect pest of the apple, infests the seeds of *Corylus avellana*, *Fuglans regia* and *Castanea vesca*. The larva of *Myelois ceratonia* feasts on the fruits of *Ceratonia siliqua* and *Castanea vesca*. The larva of the moth *Œcophaga oliviella* inhabits the kernels of the olive, causing the dropping of the fruit and a smaller yield of oil.

Passing now to another order of insects, the two-winged flies, we find that while the mouth parts of the adult flies are adapted for sucking or lapping, the young flies, which appear as grubs or maggots, are better prepared to partake of solid food. The olive in southern France and Italy is infested by a larva of a fly known as *Dacus oleæ;* in the kernels of fresh hazel nuts are often found the larvæ of a fly which belongs to the same genus as that notorious wheat pest, the Hessian fly (see Fig. 15). The fly *Trypeta arnicivora* (see Figs. 19 and 20, illustrating a nearly allied species, *pomonella*) is often gathered in its youthful state with arnica flowers and becomes developed later on, after feeding on the flowers in the pharmacist's canisters.

About two months ago, I placed a notice in the leading pharmaceutical journals of the United States, in which I asked that any insects found destroying drugs should be sent to me in order that they might be studied. As a result, several packages of drugs damaged by insects have been received from different parts of the country, giving an excellent opportunity to pursue the study further. As a result of this latter work I will refer to Plate II.

From P. R. Brooks, of Miles Grove, Pa., was received pressed packages of peppermint, marshmallow leaves, skull cap, wormwood and thorn apple. All of these drugs were infested by a small brown beetle 5 to 7 mm. in length, 2 mm. in width, with longitudinal rows of punctures on wing covers, body above and below covered with fine hairs. This insect is known as *Nicobium hirtum* (see Figs 4 and 9 for adult and larva). When the insect is disturbed, it feigns death, but soon resumes activity and seeks a hiding place. This insect, as far as we have been able to observe, is one of the worst of insect drug pests. A small box of pulverized capsicum from D. S. Morgan, Jersey City, also one from J. M. Foy, Worcester, Mass., contained both the adult and larvæ of this brown beetle. Upon examining some drugs in stock in the University's Department of Pharmacy, we found this insect in some roots of a bitter character; also, in orris root and ginger root. It is not improbable that this insect may be found attacking any drug containing starch. From Michigan (name of firm and place of residence not given) a package of caraway was received containing the larvæ of some beetles. This larva measures about 7 mm. in length, is white, with pale brown head and body partly covered with short brown hairs (see Fig. 7).

From C. L. Becker & Co., Ottawa, Kan, three packages of drugs injured by insects were received. One of them was a small package of foenugreek, in which was an insect very closely allied to one familiar to housewives of Eastern States, the notorious "buffalo bug" Fig. 1, 2 and 3 show the adult, pupa and larva states, respectively, of this drug pest. It is *Anthrenus varius*.

Its color is black and white; sometimes the white is tinged with reddish yellow. The adult insect lives chiefly on the pollen of certain plants, such as the different varieties of spiræa and those of the shad-bush, *Amelanchier canadensis*. Indoors not it only attacks carpets, rugs and woolen goods, but also collections of natural history, furs, hair and drugs. The larva is more destructive than the adult insect.

The second was a small box of Indian turnip. The drug came all right, but the insects had cut a hole through the side of the box and escaped. The third lot was a package of condition powders containing the brown insect, *Nicobium hirtum* just described.

A box pulverized marshmallow was sent from Philadelphia. In it were a number of small brown beetles. They were 11 mm. long and 2 mm. wide. The long, white larvæ was in the same box, and these are shown in Figs. 10 and 11.

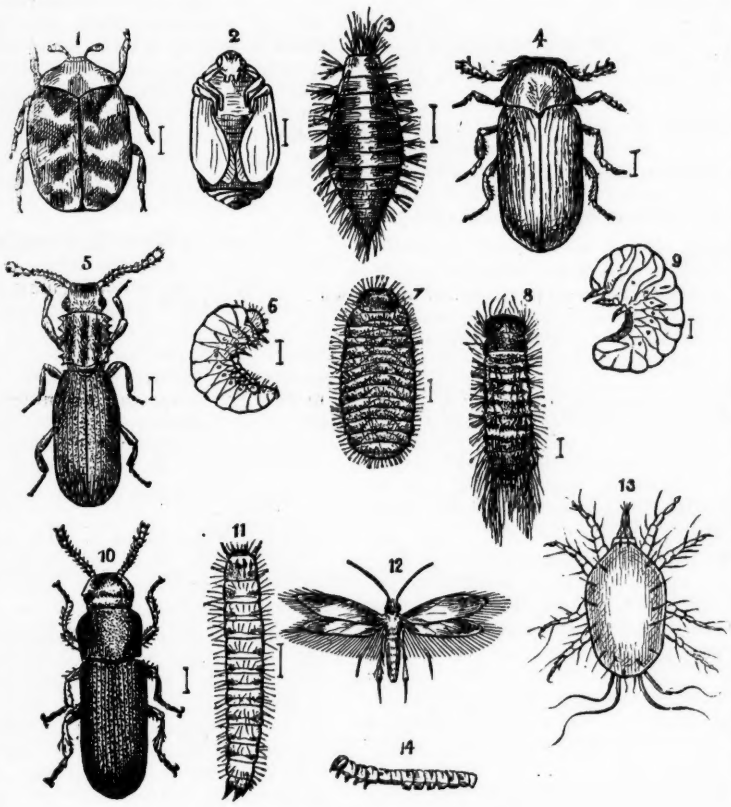
M. Noll, Atchison, Kan., sent an extract of licorice infected with some small white beetle larvæ which is shown in Fig. 6. From the same firm came a box of almond meal in which were a lot of dark brown beetles *Silvanus surinamensis*. This beetle is shown in Fig. 5, and is easily recognized by the serrated edges of the portion between the head and wings. Its long, narrow body and antennæ enlarged at the tips. Figs. 12 and 14 represented two phases in the life of a moth of the genus Tinea, frequently found flying about among drugs. Fig. 13 shows a little white mite, highly magnified, and seen as small specks on cantharides kept in stock.

So far, only insects attacking drugs proper have been mentioned, but in our investigations we have met some insects that destroy articles not properly called drugs, but always kept in drug stores. For instance the larva represented in Fig. 8 is that of a beetle which lays its eggs on bone combs. The grub, on hatching, bores its way back and forth through the substance of the comb until the comb is made absolutely worthless. Another beetle attacks horn combs, either breaking off the tips of the comb points or cutting through the side.

Our observations so far have shown: First, that the most destructive insects are the beetles or sheathed-winged insects. With the exception of one moth and one mite, all the insects received at the University and mentioned in this article, are beetles. Second, that the greater part of the drugs attacked and destroyed are vegetables or vegetable products, and hence, that these need the greatest care and watchfulness. Third, that there is need of greater vigilance and more observation on the part of druggists, if these pests are to be successfully driven out. One druggist, when asked if he had ever noticed anything destroying combs, said he had never heard of such a thing; but upon investigating his own stock he found out of a small lot two combs that were destroyed. Yet he could hardly believe that insects are capable of such work.

I shall have nothing to say in this article as to the means of prevention and the use of repellents such as have been frequently suggested in current pharmaceutical literature. It is my desire to enter this field of investigation, and anything that the druggists of the United States can do to aid in the matter will be appreciated. Attention must be given to the life

history of some of these insects. We should know what materials the insects breed in, what time they deposit their eggs, and make all the observations possible. From these notes a systematic study of the pest can be made, and results of practical value can be obtained. The Swedes, in the time of Linnæus, alarmed at the way in which their ship timber was being destroyed by a certain larva, applied to the noted naturalist for aid. He told them, that if they would sink their ship timber in the sea during the month of May, they would be bothered no further by this larva, for the beetle, which is the parent of the grub, deposits its eggs in the timber in the month of May, and at no other time of the year. If we had a more comprehensive knowledge concerning the habits and life history of insects injurious to drugs, it is very probable that easy means of preservation and prevention of insect destruction might be used.



INSECTS INJURIOUS TO DRUGS.

"Reducin," a New Photographic Developer, is highly spoken of by Dr. H. W. Vogel (*Anthony's Photogr. Bull.*, 1893, No. 12), who reports as follows: 3 grammes [45 grains] were dissolved in 500 gms. [16¾ fl.oz.] of water. The solution assumed a peculiar green color and the reducin dissolved rapidly. 9 drops of sulphuric acid and 25 grammes [6¼ drs.] of sodium sulphite were then added, the solution becoming purely yellow. 2 plates were simultaneously exposed for 10 seconds; the one was developed with sodium and pyrogallic acid, the other with reducin, 4 drops of solution of potassium bromide (1:10) being added to each developer. The picture appeared with lightning-like rapidity with the new developer, while it took about 30 seconds with the pyro developer, reducin thus proving to be a considerably quicker developer than pyrogallic acid. Dr. Vogel exposed two other plates, one 5 and the other 10 seconds, developed the latter with pyro and 4 drops of a solution of potassium bromide (1:10) to 45 of developer, the other with reducin "B" solution and 6 drops of potassium bromide solution. The picture came up again very quickly in the reducin solution, in spite of the short exposure and the increased quantity of potassium bromide; while the picture of double the exposure required with pyro about 6 times as long to appear. The author advises to use reducin in smaller quantity, viz.: 1–25 grammes [¼–6½ drs.], besides 25 gms. [6 drs.] of sodium sulphite and 9 drops of sulphuric acid in about 500 c.c. [17 fl. oz.] of water.

Detection of Cotton-seed Oil in Lard.—F. Gantter states (*Zeitsch. f. anal. Chem.*) that he has met with several samples of cotton-seed oil which failed to give a silver reaction, and also a number of samples of lard strongly suspected of adulteration with cotton oil which gave no indications by Becchi's test. He concludes that some treatment of the oil is now adopted with a view to circumvent analyses. He has modified the sulphuric acid test which depends upon the dark colorations produced with cotton oil but not with lard, and has in this respect followed Flückiger (*Zeitech f. anal. Chem*, vol. x., p. 235), who recommended dilution of the oil to be tested with ether, benzol, chloroform or carbon bisulphide, in order to moderate the action of the sulphuric acid. He takes 1 c.c. of the oil or fat to be tested, adds 10 c.c. of petroleum ether, and a single drop of strong sulphuric acid, shaking violently at once. Pure lard becomes straw colored, or faint reddish yellow; after some time the solution becomes clear and colorless, or nearly so, while dark red droplets separate. Cotton-oil at once becomes dark brown or black, and the solution remains so for a very long time. Mixtures take on a more or less dark-brown shade; even 1 per cent. of cotton-oil mixed with lard showing the reaction plainly. Olive oil behaves in a similar manner to lard, but earth-nut oil resembles cotton oil. The author also gives a number of iodine figures for pure and mixed lard, which differ considerably from those found by others. He is of opinion that pure lard should not absorb above 27 per cent. of iodine. It is noted by the *Analyst* that the coloration produced by sulphuric acid is almost entirely dependent upon the quantity of sulphuric acid added. A sample of lard dissolved in petroleum ether as directed by the author remained uncolored by a single small drop of sulphuric acid, with a large drop became yellowish, and brown with two drops. The same changes were observed with a number of other samples. It appears to the abstractor that neither the method nor the iodine figures given by the author are trustworthy.

Preservative Fluid—A patent has been issued by the German government for a fluid to replace that of Wickersheimer consisting of 600 grammes of hyposulphite of soda, 75 grammes of chloride of ammonium, 5,250 grammes of water, and from 4 to 6 liters of alcohol.

Pharmaceutical Progress

Izal is a new proprietary English disinfectant, probably of the same class as sapocarbol, cresol, lysol, etc. According to the *Chemist and Druggist*, however, it contains no phenol.

Russian Cholera Drops.—℞. Tinct. opii camph., 6 parts; vini ipecac, 4 parts; tinct. valerian ether, 12 parts; ol. menth. pip., 1 part. M. Sig. "Russian cholera drops"; 15 to 25 drops in peppermint tea, every half hour.

Thioform is the name given to the basic bismuth salt of dithiosalycilic acid. Prof. L. Hoffmeister (*Repert. für Theirheilkunde*) recommends it as being a powerful antiseptic, and since it is non-toxic it can be used more freely than iodoform or other antiseptics.

Somatose.—Recently Bayer & Co., of Elberfeld, have introduced a preparation containing (*Pharm. Centralh.*, 1893, No. 17) as much as 84–86 per cent. of albumoses, with but a minute proportion of absolute peptone, and entirely devoid of the unpleasant, bitter taste and the disagreeable odor of pure peptone.

Phytoline, An American antifat, says the *Pharmaceutische Zeitung*, is quite likely the phytolaccin of Claussen. This is obtained by extracting the acidified alcoholic extract with ether. This substance, phytolaccin, is crystalline, slightly soluble in water, readily soluble in chloroform, with sulphuric and nitric acids turns light yellow, and later dark yellow.

Black Ironwork Varnish.—Asphaltum, 48 lbs.; fuse; add boiled oil, ten gallons; red lead and litharge, of each 7 lbs.; dried and powdered copperas, 3 lbs.; boil for two hours; then add dark gum amber (fused), 8 lbs.; hot linseed oil, two gallons; boil for two hours longer, or till a little of the mass, when cooled, may be rolled into pills; then withdraw the heat, and afterwards thin down with oil of turpentine, thirty gallons. Used for the ironwork of carriages and other nice purposes.

The Active Principle of Male Fern.—According to Professor Kobert, the active principle of the male fern is not only filicic acid, but also the essential oil, which forms a kind of loose compound with the fatty acid. This mixture, or compound, is easily emulsified in the intestine, and exercises a stupefying action upon the tape worm, which is then expelled by a laxative. The ethereal extract of male fern should be prepared from the rhizomes gathered in the Autumn, for the Spring collection is less certain in its action.—*Pharm. Zeitschrift.*

Bismuth Sulphate has been studied by Dr. W. Kinzel, who states (*Pharm. Zeit*) that the neutral sulphate in needle-shaped crystals is obtained by evaporation of a solution of bismuth oxide in 30 to 40 per cent. sulphuric acid. On standing some time hexagonal tables also separate out in conjunction with the needle-shaped crytals. Dr. Kinzel believes that these latter tabular crystals are the real neutral sulphate, but was unable to obtain them free from the needle shaped crystals. The fine acicular crystals he finds not to be a neutral, but a one-third basic salt of the formula: $Bi_2\frac{(OH)_2}{(SO_4)_2}$

Erigeron Canadense.—A modern writer says that the oil of erigeron is efficient in various kinds of hemorrhage, especially when of a passive character. The dried flowering herb is recommended as a good local styptic for bleeding of the skin, especially from cuts after shaving. Professor Flagg gives two drops of a tincture made by absolute alcohol two or three times a day as an antihemorrhagic. One or two drops of the same tincture in half a teaspoonful of water is given for acute hemorrhage every minute or every half-hour, or as indicated.

Steresol, a New Antiseptic Varnish, is said by Dr. Berlioz (*La France Méd.*, 1893; No. 23) to adhere perfectly to the mucous membranes and the skin, the phenol (which is its active ingredient) not evaporating completely from the layer of varnish until after 24 hours. Its application is not painful, nor does it cause eschars, it is reported; and is said to have been remarkably beneficial in ulcerations. It permits of permanent asepsis of mucous membranes and of parts of the body where it is impossible or difficult to keep on bandages. Its composition is as follows:

Gum-lac, purified, entirely soluble in alcohol	270 grammes	[9 ounces]
Benzoin	10 "	[2½ drams]
Tolu balsam	10 "	[2½ "]
Carbolic acid, crystallized	100 "	[3⅜ ounces]
Cinnamon oil	6 "	[1½ fl. drs.]
Saccharin	6 "	[1½ drams]
Alcohol	sufficient to make 1 liter	[33.8 fl. oz.]

—*M. M. R. & P. J.*

A Point in the Analysis of Soap.—It is pointed out by E. Dietrich in a recent contribution to the study of soap, that a partial dissociation takes place of the alkali salts in soap during the salting-out process, and that by repeating the operation several times the amount of free fatty acid in the sample is unduly raised. This occurs, he states, whether the salting-out be performed in hot or in dilute solutions. For these reasons he has abandoned the salting-out process in his own work when estimating the total alkali in soap, and has adopted in its place the following modification of the well-known process of Geissler:—One gramme of the sample soap is dissolved in thirty cubic centimetres of 96 per cent. alcohol, and five cubic centimetres of decinormal sulphuric acid is added, the mixtures being then boiled until carbonic acid gas ceases to be evolved. The cooled solution is then titrated with decinormal alkali, using phenolphthaleïn as the indicator.

Military Service in France.—Under the terms of the present law in military service students in pharmacy have the faculty of serving for one year only (as against three), on the condition of having the degree of Pharmacist of the First Class before the age of twenty-six. During this period they serve in the infantry. They can either engage for service at the age of eighteen, or wait for a year or two later until they are called up, but in either case the year passed under

the flag is entirely lost in regard to their scientific training. A proposition has now been brought forward by Professor Cornil with a view of securing their incorporation in the medical service, in which they would ultimately have to serve in time of war. The existing state of things has been brought about by the republican idea that every Frenchman who has arrived at maturity should have learned the profession of a soldier, which, however, is of little use if his only business in a battle will be to look after the sick and wounded.

Syrup of Tea.—The following method of preparation of this mixture is given: One part of black tea is heated to boiling with five parts of water, and then allowed to macerate for some hours at the ordinary temperature. It is then filtered, and three parts of sugar added, and the whole heated until it is dissolved. This is filtered again, and forms a bright brownish syrup.—*Pharm. Zeitung.*

Detection of Monovalent Alcohols.—The usual methods, such as that depending upon the iodoform reaction, for detecting alcohol, are not satisfactory, since they do not apply to alcohol only, but also to other analogous substances. The following reaction, described by Bitto (*Chem. Zeit.*), although not particularly delicate, is claimed by the author to be definitely characteristic of monovalent alcohols. 0.5 grm. of methyl violet is dissolved in a liter of water, and 1 to 2 c.c. of this solution, together with 0.5 to 1 c.c. of a solution of an alkaline polysulphide, is added to the liquid to be tested. If a monovalent alcohol be present, the liquid remains clear, but becomes cherry or violet red. It must be noted that a fair amount of the liquid to be tested should be taken, and that the coloration alters on standing. In the absence of a monovalent alcohol the liquid becomes greenish-blue, and after a time deposits reddish-violet flocks, the liquid itself, at the same time, becoming yellow. The reaction appears to take place with substances containing the group C(OH). The behavior of the following bodies has been tried:

Substance.	Coloration.
Methyl alcohol	Cherry red
Ethyl alcohol	Cherry red
Normal propyl alcohol	Cherry red
Iso-propyl alcohol	Cherry red
Tertiary butyl alcohol	Violet red
Iso-butyl alcohol	Violet red
Iso-butyl carbinol	Violet red
Allyl alcohol	Violet red

Divalent and trivalent alcohols, carbohydrates, acids, aromatic compounds, phenols, etc., do not give the reaction.—*The Analyst.*

Specific Gravity of Oils.

The specific gravity of oils is an interesting subject and the following list, arranged alphabetically, includes all the common oils of commerce:

Cocoanut oil is solid at 59°–60° F.; its specific gravity at 210° F. equals 867–874.

Oils.	Specific gravity. 59–60° F.	Oils.	Specific gravity. 59–60° F.
Almond	914–920	Linseed	930–937
Apricot	919–920	Lard	914–915
Behen	912–917	Mustard	914–920
Boiled linseed	940–950	Neatsfoot	914–916
Bone	915–916	Olive	914–917
Cassia	945–948	Peach	920–922
Cottonseed	922–930	Palm	920–926
Camelina (gold of pleasure)	925–926	Rapeseed (colza)	914–916
Cress seed	928–922	Sesame	920–924
Castor	960–970	Sunflower	924–926
Croton	940–953	Seal	924–929
Cod liver	925–930	Sperm	875–884
Colza	914–916	Tea	916–917
Colphin	921–922	Tallow	914–916
Drapeseed	919–921	Walnut	925–929
Gempseed	925–930	Whale	120–930
H			

SELECTED FORMULAS.

FOR PSORIASIS OF THE SCALP.

(DR. BULKLEY.)

Hydrarg. ammoniat	℥ ss
Bismuth subnitrat	
Acid. carbol	gtt x
Unguent aquæ rosæ	℥ ij

PAPAIN ELIXIR.

(*Chemist and Druggist.*)

Papain	11.0
Glycerin	60.0
Sherry wine	150.0
Saccharin	0.4

Chloroform water, add to make 300 grammes.

Keep for a week, shaking frequently, and then filter. A teaspoonful of this pleasant and palatable digestive aid and tonic will contain about 2 grains papain; this is sufficient for general use, and a half-tablespoonful will suffice in advanced cases of indigestion.

HYPERDROSIS OF THE FEET.

(KAPOSI.—*Sem. Med.*)

Naphthol	gr. xxij
Glycerin	gr. xlviij
Alcohol	℥ j

Apply night and morning; then dust.

Or the following:

Pulv. naphthol	gr. v
Pulv. amyli	℥ j

Every morning.

FOR TAPEWORM.

(DR. DUHOURCAU.)

Extract of male fern	1.20 gm
Chloroform	3.60 gm
Castor oil	3.60 gm
Croton oil	gtt. ss

To be divided into twelve doses.

WASH FOR ECZEMA.

Benzoin	3 per cent
Soap in powder	97 per cent

FRECKLE LOTION.

Mercury bichloride	0.50 gm
Camphor	0.60 gm
Alcohol	7 c. c
Subacetate of lead	2.5 c. c
Sulphate of zinc	2.50 gm
Distilled water	250 c. c
Yellow of an egg.	

Wet the face and let it dry on.

The Preparation of Haschish.—Assistant-Surgeon Asutosh Ghose, writing, in the *Indian Agriculturist* on majoom or haschish, thus describes its preparation: *Majoom* is prepared from the leaves, tops, and tender parts of the plant called *Cannabis Indica* or *Sativa*. Four ounces of such parts of the plant are taken, free from unripe fruit, flowers, or other impurities. They are thoroughly washed, and 3 oz. of pure butter added to the leaves, with about 4 oz. of water. All these ingredients are put together in an earthen pot over a slow fire. The water is allowed to evaporate, leaving in the pot the buttered leaves, which are now strained through a piece of muslin. The strained greenish extract is removed with great care, the other impurities on the muslin being thrown away. The extract is then washed with pure water twice. In another pot about 16 ounces of sugar, with 12 ounces of water, and a little milk, are boiled. By repeated boiling and mixing of milk a syrup is prepared. In this syrup, the greenish oily extract is put, and boiled on a slow fire. Now is the time to mystify the preparation. Some add *dhatura* seeds; others nux vomica seeds in finest powder. But the usual practice in Bengal is to add a few drops of otto of roses, or a few grains of musk, powdered cardamom seeds, and sometimes a minute quantity of opium. After boiling half-an-hour, the whole mass is

poured into a flat basin. It solidifies, and is cut into cakes. Sometimes the best *haschish* is sold at sixteen rupees a seer, but usually the price is four rupees. *Haschish* is the Arabic *hashish*, which means "green, intoxicating liquor," probably derived from the Hebrew *shesh*, which means "to be joyous."

Ichthyol, according to Dr. Damiens, has properties similar to cocaine, when used hypodermatically and is reported to be very useful in *neuralgia.*

Hectograph Mass.—F. M. Horn states (*Pharm. Post*), that he has examined an excellent hectograph-mass. He first dissolved the mass in water, precipitated the gelatine with alcohol, estimated the glycerin by the acetin method,and took water by difference. The percentage composition turned out to be glycerin 70.5 per cent., gelatine 8.5 per cent., and water 21 per cent. These proportions were found to be excellently adapted here for the purpose, but say 20 of water by preference.

Electro-plating Processes.

For many years it has been recognized among galvano-platers that the processes for electro-plating with brass were faulty, that they failed to give satisfactory results, giving irregular deposits and an ugly, dirty color, etc., and a great deal of time and money has been wasted in attempts to correct these deficiencies. The concern of Wm. Pfanhauser, in Vienna, has been especially active in this direction, and have finally adopted the following formula as that giving the best results :

Cyanide of copper and potassium	40 gm.
Cyanide of zinc and potassium	40 gm.
Cyanide of potassium, c. p.	2 gm.
Ammonium chloride, crystal	2 gm.
Carbonate of sodium (by ammonia process)	10 gm.
Water	1 liter.

Heat to lukewarmness, and stir until solution is effected.

The preparation of this solution is very simple, quite within the capacity of any layman. The solution is ready for use at once, and does not need to be boiled, redissolved, etc., as is the case in all formulas hitherto published.

The bath should be kept at a temperature of at least 20 to 25° C. For electro plating the various metals the following current will be needed :

Zinc	2 volts
Iron	3 volts

Chains will need from 3 to 3½ volts, and smaller articles, hung together in mass, 4 volts.

From the composition of this bath it will be noted that the metallic contents are very high, 40 gm. of the double cyanide of copper and potassium, equaling 12 gm. of copper and 40 gm. of zinc and sodium cyanide, equaling 10 gm. of zinc, which gives the liter of solution 22 gm. of brass. The highest amount attainable under the old formulæ was from 7 to 10 gm. to the liter.

The deposit of brass is made from this solution equally even and good, on all metals, while the color is always a bright, fiery yellow. Even cast iron, upon which it has hitherto been deemed almost impossible to deposit a coating of brass, takes the metal as well as the finest steel or zinc.

If the anodes begin to be covered with a green incrustation which does not disappear over night (when the bath is not in operation), it is an evidence that the liquid is in need of additional potassium cyanide. A gram to the liter will correct the disturbance of function. If, through too much current, the bath becomes poor in metallic contents, add the double cyanides of copper and potassium and zinc and potassium in equal quantity. The practical workman easily recognizes this condition as the work progresses.

TO PLATE WITH COPPER.

The deposition of copper alone on other metals is nothing like so difficult a matter as plating with brass. In fact, it is a very simple and easy matter. While this is true, he who would avoid blistering, etc., in the process should use the following bath :

Potassium copper cyanide	80 gm.
Potassium cyanide	2 gm.
Ammonium chloride, crystal	2 gm.
Sodium carbonate	10 gm.
Water	1 liter

Dissolve as before with a very gentle heat (not more than lukewarm.)

The bath should be kept at not lower than 65 or 70° F. Current 3 volts. The rules regulating the strength of the bath, etc., are the same as in plating with brass.

PLATING WITH TIN.

The Roseleur bath, formerly in general use, has the drawback of being very poor in metal, although otherwise it produces excellent results. Pfanhauser's formula corrects this defect. It is as follows :

Tin chloride, melted	40 gm.
Caustic soda	50 gm.
Potassium cyanide, pure	10 gm.
Water	1 liter

In this bath there are 27.32 gm. of metallic tin to the liter, and with a current of 3½ volts 31 cg. of tin is deposited per hour, which is surely a satisfactory showing.

Very recently Pfanhauser has found that even better results, however, are attained with a solution in which the tin chloride is replaced by an equal amount of tin-ammonium chloride. From this bath more than double the given amount of tin is deposited hourly, viz.: 723 milligrams. The solution is very cheap and easily prepared. Cast tin anodes are the best to use. Two Bunsen elements, connected for tension, furnish sufficient electrical energy for this work. The tin deposit is rough, but is easily made white and smooth by scratch brushes.—*Der Electrotechniker* through *National Druggist.*

Solutions.*

By Ernest J. Parry, B.Sc.

One of the problems which has given rise to more discussion than almost any other, of late years, in chemical theories is the nature of substances when dissolved in water. Formerly we were content to accept as self evident, that if we dissolved a salt in water, it simply became liquid, and that nothing particular had happened. But it appears that such an apparently simple phenomenon is far more complicated than had hitherto been supposed; and to explain what really did happen,or what is believed by many to happen, required the aid of not merely the chemist, but of the physicist, and largely, too, of the mathematician. The full understanding of the theory, which is held by a very large school of chemists, on the phenomena of solution, and of many more fundamental principles of chemical science, demands what so many—the great majority, in fact—of our English chemists lack—a mathematical training ; not the knowledge of the mathematical work which one is compelled to have to obtain, for example, a degree in science, but a real working knowledge of the highest branches, of the calculus, and of high co-

*From the *British and Colonial Druggist.*

ordinate geometry; without these it becomes almost an impossibility to solve the deeper problems of physical chemistry. Hence the fact that physical chemistry is to all intents and purposes a German science. In 1887 Arrhenius enunciated a theory—new in most of its points—which, although it conflicts with many of the generally adopted views (adopted, however, as self-evident, not because of any proof of their truth) certainly agrees with a large number of observed facts otherwise almost inexplicable. The gist of his theory is that substances which are decomposed by the electric current—that is electrolytes—do not exist as such when in solution, but are dissociated to a greater or less extent, depending on the concentration of the solution. For example, a solution of potassium chloride of a certain concentration contains, according to him, no KCl, but free potassium and free chlorine. It was a commonly accepted hypothesis that the electric current on entering a solution of an electrolyte decomposed the salt into its "ions." But evidently it is necessary for some work to be done to effect this, which is not accounted for by experiment. So that it seems improbable that the current can actually decompose the salt. Clausius therefore assumed that collision of the dissolved molecules *inter se* decomposed some of them. Arrhenius was the first to attempt to put forward any definite theory on the matter as affecting the general question of solution. Before discussing several pieces of important evidence to support his ideas, it will be necessary to understand some recent work of other chemists on the determining of molecular weights from data yielded by solutions. If a substance be dissolved in a given solvent whose solidifying point is known, this solidifying point is lowered by an amount varying directly as the amount of substance dissolved, and inversely as the amount of solvent and the molecular weight of the dissolved compound. This gives us a method of determining the molecular weight of a compound; it can be found from the equation $M = \frac{RP}{GD}$ where M is the molecular weight, R a constant found by experiment for each solvent, G is the weight of the solvent, and D the observed depression in the freezing point. Now if indifferent substances, such as sugar, etc., be used experimentally in these determinations, we find the law holds good. Whereas if we use salts, strong acids or bases, we find certain abnormalities. The depression in these cases of the freezing point is always greater than would be expected when calculating on the known molecular weight of the salt. In the case of potassium chloride, it is, in moderately strong solutions, nearly twice as much, and as the solution becomes weaker, it becomes almost exactly twice as much. Hence the molecular weight of KCl in solution would appear to be half what its formula demands, or, which is the same thing, it is split up entirely into free potassium and free chlorine atoms, or quasi-molecules, as they are supposed to be capable of independent existence. And what is true for potassium chloride is true for electrolytes in general. Again, if what is known as a semi-permeable cell be prepared—that is, an earthenware cell lined with a gelatinous membrane, such as silicic acid or copper ferrocyanide—and a solution of a given substance be placed inside, the whole closed, and a manometer attached, we shall find on immersing the cell in water that a definite pressure is registered on the manometer, which, again, depends on the molecular weight of the dissolved substance. And it is found that the same substances—namely, electrolytes—that give abnormal results with the freezing point method give abnormal results in this way as well. There is yet a method of taking the molecular weight of dissolved substances, which depends on the lowering of the vapor pressure of the solvent. And in this case as well, the abnormalities appear in the same bodies, electrolytes, as in the two cases above mentioned. Not only do these abnormalities appear for the same substances in these various cases, but they appear always in the same direction and to the same extent. If, for example, there appear to be two-thirds of the molecules decomposed according to one method, the same result is obtained by the other methods. By these various methods, and by electrical evidence, it would seem that the number of "ions," or "sub-molecules," into which the halogen salts split up, is two—for example, KCl into K and Cl; in such salts as potassium sulphate, barium hydroxide, etc., three sub-molecules exist; in potassium ferrocyanide, we have five, 4K and $Fe(CN)_6$. Now, independently of the truth or the reverse of this theory, it is clear that analytical chemistry is, to a large extent, based on the exchange of ions. Potassium chloride, for example, has potassium and chlorine for its ions, potassium chlorate, on the other hand, has potassium and ClO_3. Silver nitrate is, therefore, a reagent not for chlorine, but for the "ion" chlorine: and, in the same way, we know that ammonium sulphide gives a black precipitate with ferrous sulphate where the "ion" Fe exists, but with potassium ferrocyanide with the "ion" $Fe(CN)_6$ exists we get no precipitate. This seems best explained on the assumption that the salts are actually dissociated, and that is only between silver and chlorine in the state of free elements in solution, that inter-action can take place. Furthermore, there are many reactions which undoubtedly take a finite time for completion, which would be best explained on the assumption that partial dissociation exists, and that as the free ions interact, further dissociation takes place to provide more free ions. The question, then, as to what salts are really in solution when we mix, for example, sodium chloride and magnesium sulphate in water, receives a definite answer if this theory be true. No salts are in solution but a mixture of sodium, of chlorine, of magnesium, and SO_4. These free ions are capable of combining to give different salts according to the condition of the experiment. By heating to evaporate the solution NaCl and $MgSO_4$ are formed on account of the lesser solubility of NaCl, whereas at ordinary temperature Na_2SO_4 is deposited on account of its greater insolubility at the temperature of operation. Now on electrolysis it is assumed that the ions, charged heavily with electricity, move in certain directions, led by the current, until they arrive at the anode and cathode respectively, where they give up their charges. On the first view it would certainly seem absurd to believe that a clear solution of potassium chloride contained free potassium, so well known as a solid body, and free chlorine, a yellowish gas. But we must remember that electric charges alter the properties of bodies exceedingly, and what we are supposed to be dealing with is not free potassium and free chlorine, but these elements with heavy charges of electricity, which, when led to the metallic plate, give up these charges and appear in their ordinary form. A very striking experiment in illustration of this has been, I believe, actually performed by Ostwald. Two glass beakers are filled with a solution of potassium chloride, and connected with a metallic siphon. A conductor, charged with "negative" electricity, is brought close to beaker No. 1. The result is that beaker No. 1 and its contents will be charged positively, and beaker No. 2 and its contents will be charged negatively. Now remove the siphon, and finally the charged body; the beakers will now remain as they were, charged with electricity of

opposite sign. If the dissociation hypothesis be true the free ions must have moved along with the electricity—that is, there must be an excess of positive ions that is potassium atoms in No. 1, and an excess of negative or chlorine atoms in No. 2. Being heavily charged with electricity, however, they would not appear as such. But on *dis*charging the beakers, it is seen that this is actually the case, for chlorine gas appears in No. 2, and free hydrogen, that is, of course, on account of the action of the potassium on the water in No. 1. Thus the ions, having given up their charges, appear as ordinary elements. Now, after understanding that such a state of dissociation does exist, it becomes important to learn if entire or only partial decomposition has taken place. It is found that in the case of good conductors practically complete dissociation takes place in very dilute solutions; whereas in the case of poor conductors there never happens such complete dissociation. By a process of mathematical reasoning, which need not be here reproduced, it is shown that the proportion of decomposed molecules in a given solution is given by the equation $M = \frac{K}{K^1}$, where M is the fraction of the molecules that is dissociated, K is the "molecular conductivity for electricity" of the solution and K^1 the same for a solution of the salt infinitely dilute. And the results obtained in this way agree entirely with those found by the freezing point and other methods. In England this theory has many opponents—notably, S. U. Pickering and Dr. Armstrong, who tells us he believes it to be merely "fashionable" to support it. However, there appears to be much to be said for it and much against it, and time alone must settle whether we are to stick to what our grandfathers taught us, or take up the "new-fangled" ideas about solution.

Pernambuco Jaborandi.*

BY E. M. HOLMES, F.L.S.,

Curator of the Museum of the Pharmaceutical Society of Great Britain.

The leaves and fruit of the Pernambuco jaborandi were described and figured in the *Pharmaceutical Journal* eighteen years ago,† but until quite recently I was unable to obtain the inflorescence in good condition. At the time I pointed out that the plant was probably distinct from *Pilocarpus pinnatifolius*, Lem., under which name the drug has been frequently described.‡ There is little doubt, however, that an inferior variety of jaborandi, said to be collected near Asuncion, in Paraguay, is obtained from *P. pennatifolius*, since specimens of the fruit taken from the drug in commerce are similar in character, and the flowers are also of the dull purple color, like that of cultivated plants of *P. pennatifolius* in Mr. Thos. Hanbury's celebrated garden near Ventimiglia. The leaves also are thin, obovate, tapering at the base, and the veins on the upper surface are not prominent.

Through the kindness of Mr. R. I. Lynch, F.L.S., Curator of the Botanic Gardens at Cambridge, I received last year a perfect inflorescence of the Pernambuco plant which has been in cultivation both there and at Edinburg for a few years. The inflorescence proved at once that the Pernambuco plant is a distinct species. The principal distinctive characters were pointed out at an evening meeting of the Society last year (*Pharm. Journ.* [3], vol. xxii., p. 875), but a botanical descrption of the plant has not yet been published. This may now be given as follows:

*Pilocarpus '*Jaborandi,*'* n. sp., *ramis* erecto-patentibus, ramulis junioribus plus minusve puberulis; *foliis* alternis imparipinnatis; foliolis oppositis, fere 4–5 jugis, anguste ellipticis, coriaceis, rigidis glanduloso-punctatis, long. 10–15 cm., lat. 2½–5 cm., fere emarginatisl marginibusque paululo recurvis, basi inæqualibus, in petiolum perbrevem 5 mm. constitutis; *floribus* in racemum terminalem pedalem curvatum rachide gracili dis positis, sœpissime deciduis, pedicellis tenuibus, long ½-1 cm., roseis, minute bracteolatis, bracteolis subulati, supra medium dispositis; *calyce* minuto, 5-angulariunon rite lobato; *corolla* rotata, petalis quinque, ovatis acutis, 1-nervis, pallidoluteis medio transverse roseo-suffusis; disco rugoso crenato, glanduloso-punctato; *staminibus* quinque, filamentis compressis lineari-attenuatis, antheris innatis; *ovario* 5-carpellato; fructibus maturis paucis, carpellis convexis apice rotundatis transverse striatis, glanduloso-punctatis, seminibus in carpello singulis nigris nitidis.

Hab. Pernambuco; specimen cum floribus in Hort, Cantab. Angliæ cultis, a me solum visum.

The most marked features in this species are (1) the deciduous pinkish-yellow flowers with slender pink pedicels, (2) the less quadrate, larger, and more convex carpels, as compared with those of *P. pinnatifolius*, Lem., (3) the more leathery leaflets, with elliptic outline, unequal base, and prominent veinlets on the upper surface, the leaflets being normally in four pairs.

As the leaves of *P. Jaborandi* are known to yield more alkaloid than the Paraguay plant, the former only should be official. For pharmaceutical purposes the leaves may be described as follows:

Leaves coriaceous, elliptical, entire, emarginate, somewhat rigid, 10–15 c.m. long by 2½–5 broad, tapering equally towards either end, oblique at the base, with the veinlets on the upper surface distinctly prominent.

* From *The Pharmaceutical Journal and Transactions.*
† P. J., (3), vol. v., pp. 581-583.
‡ Bentl. and Tirmen, 'Med. Plants,' No. 48; 'Bot. Mag.,' tab. 7235.

The Manufacture of Gelatin Dry Plates.*

By J. Desire England.

I do not wish to trouble you to-night with any history of the gelatino-bromide process, but my aim will be to make this paper as practical as possible, and if no very great rapidity of plates is required, I think you will find the process of manufacture a very simple and interesting one, especially to those who have any knowledge of chemistry. There is, of course, as you all know, a very wide range in the sensitiveness of plates, and such sensitiveness depends upon the formula and method of making, connected with many small details which have to be observed. Let us first consider the nature of the emulsion which is to be used in the coating of plates. An emulsion may consist of either bromide of silver or a mixture of bromide and iodide in a very fine state of division, suspended in a solution of gelatin. The preparation of the emulsion may be divided into three stages, the mixing, the emulsification, and the washing. The gelatin employed is of the first importance, and without a suitable sample success is impossible. In the first stage a soft gelatin should be used—say Nelson's No. 1—but for adding afterward a harder kind, such as Heinrich's or Drescher's, must be employed. With regard to the bromide of potassium, the iodide of potassium and nitrate of silver, they must be pure, each make of the different chemicals producing a somewhat different result. There are two or three methods which may be employed in making the emulsion. We can, after mixing, to produce sensitiveness, keep the emulsion stewing for from one to five days, or more at a

*Communicated to the Photographic Society of Great Britain.

temperature of from 90° to 95°, or, by raising the temperature and boiling, the same result may be obtained in an hour or two, or even sooner, by the ammonia method. The method of stewing at a temperature of 90° to 95° was, I believe, one of the early methods, Bennett's process. I shall now show you how to make an emulsion by the boiling process, the formula for which is as follows:

NO. 1.

Potassium bromide	90 grains
Potassium iodide	3 "
Gelatin (soft)	20 "
Water	1½ ounces
Hydrochloric acid	2 minims

NO. 2.

Silver nitrate	120 grains
Distilled water	2½ ounces

NO. 3.

Gelatin (hard)	150 grains

The best temperature for mixing is 110° to 120°. For mixing the solutions, adding the silver to the gelatin, I find the best plan on a small scale is to insert a plug of cotton-wool in a funnel, and then by pushing the wool down, one can very well regulate the speed at which the solution should flow. In the boiling itself, a very small proportion of gelatin is employed, the bulk being added afterward. We add the 2 minims of hydrochloric acid in order to prevent fog in the after processes, on account of the gelatin becoming somewhat alkaline, and also to correct a very slight alkalinity in the bromide of potassium. I need hardly say that all these operations from now (mixing) must be conducted in the dark room. The nitrate solution should be quite clear, and would be so if made with distilled water. The time actually occupied in pouring the nitrate of silver solution into the gelatin solution has a great influence upon the subsequent sensitiveness of the emulsion. In my own practice, where I mix several gallons at a time, I have mechanical means for stirring during mixing, and also during the time of boiling, of which apparatus I have brought a model. The plug of cotton-wool in the funnel serves a two-fold purpose; it filters out any dirt or other undesirable matter, and it also regulates the speed of the flow. The emulsion, when first mixed, ought to appear of a reddish color by transmitted light. As the boiling proceeds, we shall see that the color will alter, passing from red to violet, bright blue, then green, and finally gray, which latter stage we must avoid if we wish to keep the plates free from fog. It will now be advisable to go into the changes which have taken place in the mixture. The silver of the nitrate has combined with the bromine in the potassium bromide, forming bromide of silver and nitrate of potassium. The nitrate of potassium we shall have to consider presently. There is also an excess of bromide of potassium, that is, more than will combine with the nitrate of silver. The excess of bromide in the emulsion plays a most important part, as, without it, it would be impossible to obtain any sensitiveness, and there would always be danger from fog. I am led to believe, from my own observations, that the changes which go on during boiling are as follows: Bromide of silver being soluble to a slight extent in bromide of potassium, there is a constant dissolving and re-precipitation, and with each precipitation the particles are deposited in a coarser and coarser state. The relative coarseness can be easily examined by means of a powerful magnifying glass. This coarseness will also be seen in coating the more rapid emulsion, as it has not the same covering power as the slower. While this emulsion is boiling, I will show you how to make a more rapid emulsion by the ammonia process. The chief feature is that the nitrate of silver is converted into ammonio-nitrate of silver, and the free ammonia acting upon the bromide of silver and gelatin, the rapidity of the emulsion is gained in a very short time. The following formula for ammonia emulsion was, I believe, first given by Mr. Henderson, who was a great authority upon the ammonia process:

NO. 1.

Gelatin (soft)	20 grains
Potassium bromide	180 grains
Potassium iodide	3 grains
Water	4 ounces

NO. 2.

Silver nitrate	240 grains
Water	4 ounces

NO. 3.

Gelatin	360 grains

Convert No. 2 into ammonio-nitrate with liquor ammoniæ fort., and add to No. 1. The solutions should be mixed at a temperature of about 105° to 110°. The amount of gelatin in this process has a great influence upon the rapidity; with less gelatin one gets a more rapid plate, but, at the same time, the plates are rather inclined to be thin. In all operations connected with dry plate making, one must exercise the very greatest care in avoiding things which one does not want to get into the solutions. By this time I expect we shall already find some little change in the boiling emulsion. It has become a little more dense, and is passing on to the violet stage. Returning to the ammonia process: We have here a solution of nitrate of silver (No. 2), and we have now to convert it into ammonio-nitrate, and for that purpose it is necessary to have the strongest ammonia possible. First of all, an oxide is formed—oxide of silver—and it is then advisable to add only just sufficient ammonia to re-dissolve the oxide. The solutions should be mixed in the same manner as in the boiled emulsion process, and at a temperature not higher than 110°. That which I just mixed was at a rather higher temperature, and is consequently already in the violet stage. The exact amount of gelatin is of no very great importance and at this stage of the ammonia process we add the gelatin dry.

The Determination of Hydrastine in Fluid Extract of Hydrastis.*

By O. G. Eberhart, Ph.G.

Not so very many years ago, the most important constituent of hydrastis was considered to be berberine, and the valuation of the drug was assumed to be accomplished with the estimation of that alkaloid. Since then, however, hydrastine has been found to be medicinally of greater importance, and at present no valuation of the drug or its preparations can be considered complete which does not include an estimation of the white alkaloid. In looking over the literature, very little is found to have been done in this direction. A. B. Lyons (*Am. Jour. Pharm.*, 1886, P. 583 and 586) and also H. W. Snow (*A. J. Ph.*, 1888, P. 494) give some data for its estimation with Mayer's solution, but no specific directions for manipulating the drug or any of its preparations. In the *American Druggist* for 1885, page 84, is a paper by W. Simonson on the estimation of hydrastine in fifty samples of powdered hydrastis. The method employed by him consisted in expelling the alcohol from two fluid ounces of tincture, representing sixty grains of drug, adding water to separate oil, resin, etc., and precipitating the crude alkaloid from the filtered solution with ammonia. This precipitate he collected on a filter, washed it with dilute HCl and water until nothing more was dissolved, when, after again drying and weighing, the difference was taken as alkaloid. The average yield

* Read at the 12th annual meeting of the Indiana Pharmaceutical Association at Indianapolis, June 7 and 8, '93.

from the fifty samples operated upon by him was 0.125 per cent. Having occasion to investigate a certain lot of fluid extract of golden seal, the writer made a number of experiments, during which it was found that the addition of a small amount of ammonia to the fluid extract caused, after some time, the separation of hydrastine in well defined and remarkably pure crystals, but unfortunately accompanied by a dark flocculent precipitate that would accumulate on the filter into a compact mass very difficult to wash free of alkaloid. In following up this clue numerous attempts were made without success, to avoid the precipitation of this dark substance, but the experiments developed a number of interesting facts.

It was found: First, that by observing proper conditions, the alkaloid could be obtained in comparatively large, acicular, and nearly colorless crystals directly from the fluid extract.

Second, that the presence of ether in quantity sufficient to saturate the mother-liquor very much assists crystallization and enhances the purity of the product.

Third, that if the fluid extract be heated before adding the precipitant a larger yield of crystals is obtained.

Fourth, that the crystals can readily be separated from the accompanying flocculent precipitate by passing the liquid through a pellet of cotton loosely inserted in the neck of a funnel. The long needle-shaped crystals of alkaloid become entangled and are retained, while the finely divided precipitate is permitted to wash through.

Fifth, that the presence of 20 per cent. to 25 per cent. by volume of official alcohol is necessary in order to secure good crystals, and

Sixth, that a good fluid extract of golden seal should yield from 1.5 per cent. to 2 per cent. of crystallized white alkaloid.

Without going into the tiresome details of many experiments the process finally found to give the best results was the following: Into an Erlenmeyer flask of at least 4 ozs. capacity is put 25 c.c. of the fluid extract. This is heated on the water-bath to a point considerably short of boiling. Ten cubic centimetres of ether are now slowly and carefully added so as not to cause loss by violent ebullition, and last, 25 c.c. of a 2 per cent. ammonia solution or a mixture of 20 c.c. of water with 5 c.c of ammonia. The contents of the flask are rotated briskly for a few seconds, and the whole then set aside for 12 hours, frequently rotating during the first two or three hours. After 12 hours the liquid is poured off into a funnel, into the neck of which a small plug of cotton has been loosely inserted, and the whole then dried and weighed. When the liquid has all passed through, the crystals remaining in the flask are carefully rinsed into the funnel and washed with distilled water until the washings pass off free of color. The funnel and contents are now dried at a temperature not exceeding 100 degrees C., cooled in a desiccator and weighed. Subtracting from this weight the weight of funnel and cotton, gives the amount of alkaloid obtained.

The fluid extract operated upon in all experiments was made with dilute alcohol, and consequently, after the addition of an equal volume of ammonia solution, the mixture would contain approximately 25 per cent. by volume of official alcohol. This was found to give the most satisfactory results, all proportions having been tried, from 50 per cent. down to 10 per cent. The official fluid extract hydrastis is made with a mixture of three parts alcohol and one of water, which would necessitate preliminary evaporation to 19 c.c., or else the addition of 50 c.c. of ammonia solution in order to reach the same proportion. The addition of ether to a hot liquid naturally results in the loss of a large portion of it, but enough remains to saturate the liquid, which is all that is required. An excess of ether, causing the separation of another layer, should be avoided. Agitation is necessary, as it facilitates the separation of alkaloid, but violent shaking, especially at the time when crystallization is actually going on, must be avoided, as it results in the formation of many small crystals that are apt to pass through the cotton and be lost. The production of large crystals must be aimed at, and when the process is properly conducted they can be obtained from 1/8 to 3/8 of an inch or more in length.

The crystals cannot well be collected on a filter, for the impurity spoken of above, which is simultaneously precipitated, will also be retained and necessitate a second or even third crystallization. The use of cotton obviates this. A little practice, however, is necessary in preparing the funnel. If the cotton plug is inserted too tightly it will soon clog and render thorough washing impossible; if too loose, alkaloid may pass through. Very naturally the cotton retains some coloring matter, but this can be ignored as it never amounts to more than a few milligrammes, and does not introduce any appreciable error. If it is desired to determine the amount of berberine also, it can be obtained from the mother-liquor of the hydrastine determination, but the order cannot with advantage be reversed, because, when the fluid has once been treated with acids to precipitate berberine salts, the hydrastine obtained from it is very impure, and also more difficult to purify.

An alternative process of assay, which, however, requires more attention, consists in rendering 25 c.c. of fluid extract alkaline with ammonia, and rotating in a separator with three separate portions of ether, of 15 c.c. each, extracting the alkaloid from the mixed ether washings by agitating them with three portions of 10 c.c. each of two per cent. sulphuric acid, and lastly with 5 c.c. of distilled water, adding to the combined washings 10 c.c. of alcohol, 3 c.c of ether, and ammonia sufficient to render alkaline. After allowing to stand for six hours, with frequent agitation, the crystals are collected, dried and weighed.

The results obtained in a limited number of determinations by both methods are given in the following table:

	Shaking out Alkaloid from 25 c.c.	Per Cent. of Alk.	Precipitation Alk. from 25 c.c.	Per Cent. of Alk.
Fl. Ext. No. 22907.	.447	1.78	.458	1.83
			.443	1.77
			.442	1.76
F. E. No. 22911.	.455	1.82	.445	1.78
			.485	1.94
			.582	2.32

A small amount of alkaloid is retained by the mother-liquor, for which, perhaps, a correction ought to be made. The quantity thus lost is proportionate to the amount of alcohol present, and in a solution of the pure alkaloid, under the exact conditions of the assay process, amounts to 0.038 grm. Whether this correctly represents the amount retained by the mother-liquor in the assay of the fluid extract is a point that remains to be determined before the correction can be applied. The process has not yet been adapted to the assay of the drug, the tincture, the so-called non-alcoholic fluid extract, nor the various fluid preparations of hydrastine.

In conclusion I will say that this assay process could be utilized in the manufacture of the alkaloid, and considering the largeness of the yield and the ease with which it can be isolated, there seems no reason why hydrastine should continue to command the enormously high price that has prevailed in the past.

Medical Notes.

Ichthyol is highly recommended by Dr. Damiens, subcutaneously, as an anodyne, particularly in cases of neuralgic pains associated with inflammatory processes which have caused exudation; in addition to the absorption of the inflammatory swelling, it effects the suppression of the pain.—*Am. M. S. Bull.*

Antipyrine Habit.—A case of antipyrine habit is reported, in which the patient, a nervous woman of twenty-three, had used the drug for headache. For two years she had taken nearly eight grammes a day. The symptoms were those of great prostration, muscular weakness and insomnia. In the gradual reduction of the dose caffeine was used to meet the functional disturbance. A cure was finally accomplished.—*Boston Medical and Surgical Journal.*

Salicylic Acid for Tape-Worm.—Ozegovski recommends the following treatment for tape-worm. The patient takes no mid-day or evening meal, and at bed-time is given 30 grammes of castor-oil. The following morning at 7 o'clock a second dose of 15 grammes of castor-oil is given. An hour later one gramme of salicylic acid is given, to be repeated every hour to four doses. If the worm is not expelled by this time a third dose of castor-oil is indicated.—*Münchecner Med. Woch.*

Antiseptic Treatment of Gleet.—Dr. WATIER tried to use injections of sublimate in the case of gleet, but the solution of one ten-thousandth part is still caustic, and the solution with one twenty-thousandth is not active enough. He uses the following formula:

Distilled water	1,000 gme. [2 pints]
Antipyrine	10 gme. [3 ijss]
Bichloride of mercury	10 cg. [gr. iss]

Patients must take three or four injections a day, in preference after micturition, and the liquor must be kept in the urethra as long as possible, at least half an hour; it is best to use it tepid.

Digital Compression in the Vomiting of Anæsthesia.—Dr. Bernard Joos describes a method for the control of the hiccough and vomiting during anæsthesia, which he has found successful for several years. It consists in digital compression of the phrenic and vagus nerve against the sternal end of the clavicle. His method is as follows: As soon as singultus or vomiting begins, the etherizer presses the last phalanx of the left thumb firmly over the sternal end of the clavicle, the body of the thumb being parallel with the clavicle and the hand resting on the chest. The pressure is made with the radial side of the thumb. The vomiting stops at once, as a rule. If needed, or more convenient, the pressure may be made on the right side. Pressure is continued for a few moments to prevent a return of the vomiting. He recommends the trial of this method in cases of sea-sickness.—*Korresponaenzbl. Schweizer Aerzte.*

Treatment of Typhoid Fever.—Dr. Hälscher has obtained excellent results from the administration of twenty grains of carbonate of guaïcol, morning and evening, in the treatment of typhoid fever. Under the influence of this agent, combined with acetenalide, the temperature falls rapidly and the malady is cut short by several days. Carbonate of guaïcol acts chiefly as an antiseptic of the intestines; it has also a very favorable effect on the bronchitis which too frequently accompanies this fever.—*Med. Press and Circular.*

Solar Cautery.—Dr. C. M. Richter states in a paper read before the San Francisco County Medical Society that he has obtained the best results from the use of the concentrated rays of the sun as a cautery in the treatment of capillary aneurisms, varicose veins, indolent, chancroidal and rodent ulcers, epithelial cancers, birth, India ink and powder marks, bleeding vessels and surfaces, hemorrhoidal and erectile tumors, morbid growths, such as warts, moles, small wens and all skin diseases of a parasitic nature. It has the advantage that it is always under the control of the operator, that the irritation and inflammation following its application are of exceedingly short duration, the pain subsiding immediately on the removal of the lens, the rays of the sun apparently possessing a hitherto unexplained curative power.

Carbolic Acid and Vaccine Lymph.—W. Alexander, M.D., writing to the *Lancet*, says: A short time since I had occasion to vaccinate eighteen men, but having only one square of lymph, sufficient for fifteen persons, I proceeded to dilute it by adding three drops of what I considered to be pure water from a vessel placed at hand to receive the points as they were used. On inspecting the arms on the eighth day, I was surprised to find that all had failed with three exceptions, one being a previously unvaccinated person, and each of these presented a single modified pustule.

On making inquiry as to the possible cause of so many failures, I remembered the incident of diluting the lymph, and learned that what I considered pure water was a very weak solution of carbolic acid, 1 part in 120, thus showing that $\frac{1}{40}$th of a drop of carbolic acid was sufficient to render almost innocuous the infecting element of fresh vaccine lymph.

The Cure for Wine, Woman and Song.—The *Medical Record*, of New York, in referring to an article on wine, woman and song by Dr. Frank Kraft in the *Medical Advance*, remarks that Dr. Kraft finds that excesses of wine, or rather alcohol, breeds three kinds of drunkards, each of which is best set up by certain remedies. These are his three pharmaco-clinical types: "Nux vom. for the beer drunkard, gelsemium for the champagne drunkard, and sulphuric acid for the 'rot-gut' whiskey drunkard." It appears from this that the hard drinker has only to make an intelligent diagnosis of himself and then fill his pockets with sulphuric acid, nux or sempervirens, as the case may be, in order to keep in good condition.

"Woman," Dr. Kraft thinks, "has caused man considerable trouble," and this cautious estimate of social history will not be generally disputed. We turn with some interest to find the drug which solaces man when he has had embittering experiences. Hyoscyamus, we find, is suited to relieve a disappointment in love so severe as to make the victim turbulent, talkative and irritable. Henbane quells the noisy lover.

Belladonna helps the moody, sleepless and dangerous man. Let the ladies take notice, and reject their suitors with vials of the proper antidote. Nux vomica is for the passionate, sensual fellow who loves not well but for amorous ends, while staphisagria cures the man who is simply humiliated and mortified at his refusal. "If disappointment in love makes a man swear, give veratrum," says Kraft; "if it makes him lie give anacardium, and if it makes him a blackguard give chamomile. If he is intensely erotic, let him chew camphor."

For the ills that come from song, Dr. Kraft does not say so much. He is vindictive toward tenors who sing too much and thinks they may be helped by stramonium. For the ill effects upon man of the song of others, his list is far too short, and includes only natron mur. followed by sulphur and belladonna. The foregoing is contemporary medicine, though it sounds like a dream-book.

Aleuronate for Diabetics.

Professor H. Baildon communicates to the *American Medico-Surgical Bulletin* an adaptation of Prof. W. Ebstein's conclusions as to the therapeutic value of vegetable albumen in the form known as aleuronate.

Aleuronate is a fine flour, yellow, and nearly devoid of taste and smell. Its chemical analysis shows that it contains between 80 and 90 per cent. of vegetable albumen. There is to be found in it, besides this proteid, 7 per cent. of carbo-hydrates, and 8.8 per cent. of water. Aleuronate is absolutely stable, and undergoes in itself neither decomposition nor putrefaction. It is not affected by changes of climate, which is not always the case with many other forms of gluten flour and their preparations. A superior value is claimed for aleuronate as a human food, both in health and disease. It is claimed to have been proved that the vegetable albumen of aleuronate can be utilized as well as the proteids of the animal kingdom; besides, it is less expensive than animal proteids.

Prepared according to the rules of Hundshausen, aleuronate is a fine flour, nearly unchangeable in a dry place. Heat does not dry it like most of the ordinary forms of gluten flour.

To make bread, instead of trusting to the baker, these general rules must be strictly followed: Great cleanliness of the utensils and purity of the ingredients must be the starting-point; well-rising yeast, more active or more abundant than for ordinary bread, a specific quantity of liquid to a given amount of flour; a good bread-oven of any kind for the cooking.

BREAD FOR DIABETICS.

To make this bread, take 600 grammes of ordinary flour; 150 grammes of aleuronate flour, 20 grammes of yeast, half a pint of milk, 5½ grammes of coarse salt, and about 1 gramme of sugar. The flour, the aleuronate and the recipient must first be heated to about 30° C. [86 F.]. They must be well mixed,—as follows:

Half the milk must first have been heated to about 30° C. [86 F.], the sugar then added to it, and this mixture poured over the yeast, which must have been previously crushed, or finely pulverized. This complex mixture must then be left to ferment in a warm place, the temperature of which is not higher then 30° C. [86 F.]. When the yeast has worked sufficiently to cause effervescence, the fermented liquid must be poured into the middle of the aleuronate and flour. The whole is then gently stirred, and the other half of the milk heated the same as before, and with the salt previously added to the milk, is introduced; which completes the mixture. The dough must then be kneaded lightly with the hands; and when the loaves are well raised, they must be coated with butter and baked with a rapid fire

If the loaf is not eaten the first day, it must be recooked the next day, just before it is expected to be used. This bread is now supplied regularly by Fluschman's bakery in this city.

Treatment of Erysipelas of the Face.

Dr. Petrini treats as follows erysipelas of the face, and assures us that he has always obtained very good results. He commences by administering the following purgative:

Calomel	grs. xv.
Scamony	gr. viii.

Divide into two wafers, to be taken in the morning within half an hour of each other.

His local treatment is as follows:

Corrosive sublimate	gr. ii.
Collodion	℥ij.

Paint the face over twice a day for three or four days.

The patient is put on milk diet, and on the second day two of the following pills are given every two hours:

Sulphate of quinine	ʒ ss.
Iodoform	grs. vii.
Syrup of tolu	aa q. s.
Extract of gentian	aa q. s.

Divide into twenty pills.

M. Petrini affirms that with this treatment isolation is superfluous.—*Med. Press and Circular.*

FAVORITE PRESCRIPTIONS.

BROMOFORM FOR WHOOPING COUGH.

(BURTON-FANNING IN *Practitioner.*)

Bromoform	*M*i
Pulv. tragacanth comp	ʒ ss
Syr. simp	ʒ ss
Aqua ad	℥ ss

For children under one year, *M*ss. From one year to three years old, *M*i. From three to six years old, *M*ii thrice daily. These quantities may be gradually increased until the doses are doubled. As bromoform is a heavy liquid, the mixture should always be shaken.

TO PREVENT PITTING IN SMALL-POX.

(LEBESQUE.—*Med. Week.*)

Corrosive sublimate, Opium extract	of each 1 gme. [15 grains.]
Alcohol	5 gme. [1½ fl. drs.]
Glycerin	60 gme. [1½ fl. oz.]

Paint frequently on the face and neck, so as to keep the parts constantly moist.

HAIR TONICS.

(*Chemist and Druggist.*)

I.

Tr. cantharidis	ʒ j
Spirit ammon. arom	℥ iss
Tr. cinchon. rub	ʒ j
Ol. rosemar	mxx
Perfume	q. s.
Glycerini	℥ ij
Aqua ad	℥ xx

Mix the tinctures and spirit, add oil and perfume, then the water in which has been suspended ½ oz. of magn. carb. levis, filter through a wetted filter paper and add glycerin to filtrate.

II.

Liq. epispastic. B. P.	ʒ iij
Acid. acet. glacial	ʒ j
Eau de Cologne	℥ ij
Glycerini	℥ ij
Aq. ros. ad	mxx

Educational.

PRACTICAL SUGGESTIONS TO THE STUDENT.

The selection of a college is a momentous epoch in the career of the young pharmacist, and the various advantages and disadvantages of the different schools should be most carefully weighed.

The question of expense, while a very important one, should not be allowed too great weight. It unfortunately sometimes happens that the would-be student is so situated that monetary considerations are of paramount importance. In most cases, however, the selection of a more expensive course merely means a little more rigid economy, possibly some self-denial, and if it is merely *self*-denial that is involved by undertaking what the embryo pharmacist is convinced is the best course, he should not hesitate, but take up the best. The very self-denial involved will of itself be an important and helpful factor in the development of his character, and the development of character is one of the most important functions of all education.

The student having selected the college which he wishes to attend must now determine whether or not he will endeavor to earn his own support by seeking employment during the college session. Here, again, it may be that fortune or misfortune leaves the student no option or he may have determined this beforehand by selecting as his alma mater some college whose roster is so arranged as to require all of the scholar's time during the sessions. The ideal student life has no division of interest. It means an uninterrupted devotion to study and experiment, but where financial considerations make it necessary for the student to accept an engagement during his attendance on college it by no means follows that he is thereby compelled to take a low rank in his class. Indeed, if his experience prior to entering college happens to have been in a country town, he will find that the necessity of working in a city store is by no means an unmixed evil, the experience gained, if it be of the right kind, being of the greatest possible advantage to him in his after life.

Our student having decided, we will say, to attend a school in a large city some distance from home, and finding that it will be necessary for him to seek employment, should at once communicate with the secretary of the college, who will always endeavor to aid him toward procuring employment. The character of employment he should seek must be governed by his previous experience, his attainments and his plans for the future.

He should endeavor in taking a situation to obtain one where his defects of training or attainment can be most thoroughly made good.

If his prescription experience has been limited he should go to a large store in the wealthier residence portion in the city

If his knowledge of manufacturing be deficient he should supplement it by seeking an engagement with a manufacturing pharmacist, preferably one of those retail pharmacists who manufacture on a small scale mostly for their own wants. The advantage offered by such a position is that a much more varied and available knowledge is gained than in a strictly manufacturing plant, where during his one or two years engagement he would probably be confined to one class of work.

If it is in the line of theoretical knowledge that our student is weakest, he may find in the suburbs an opening in the store of some physician, one of the smaller stores in the poorer sections where the store is mainly or wholly dependent upon the prescriptions of the owner. Here he may get his board and a small salary. He may be closely confined, but will probably have a good deal of time in the store for study, a definite understanding being arrived at beforehand, that the student may utilize his spare time in the store in study.

He should not wait, however, to begin his studies until he reaches his college, but should at once begin to prepare himself as best he can to profit by the lectures and lessons he is about to take up.

The student should not neglect to read the pharmaceutical journals. They give a kind of reality and personal interest to the studies being pursued. The seemingly dull and monotonous detail of cellular structure may chance to be touched upon in some article in a way to illuminate and vivify the whole subject, or some stray paragraph may happen to furnish an illustration of the phenomena of polarity which will clear up the fog, heretofore surrounding the subject in the mind of the student.

And above all, dear student, be true—not merely commercially true but with that profounder adherence to truth in its minutest detail to which all scientific progress is due. If a reaction is not *exactly* right it is altogether wrong; do not delude yourself by thinking "that's good enough;" do it over again until it is exactly right. Along these lines only can substantial progress be made.

We continue below the sketch of the colleges of the United States begun in the last special issue.

The Chicago College of Pharmacy.—It was organized thirty-four years ago by a number of the most progressive pharmacists of the city. There are only two colleges of pharmacy which are older than the Chicago, and when we recall the fact that the city itself is only fifty-six years old, no other college can claim such great age when compared with the age of the city in which it is located. The college is conducted so as to aid young men in obtaining knowledge and thus improve the status of the profession. The fees are only about one-half what are charged by some other well known colleges, the running expenses are paid and tuition fees are placed at the figure which experience demonstrates is just sufficient to cover the outlay.

The college prides itself upon being provided with every facility for instruction and in being progressive in taking advantage of any and every thing which will promote the interest and welfare of the student. The faculty is selected from well known and experienced pharmacists. The veteran teacher, N. Gray Bartlett, lectures on chemistry. F. M. Goodman is dean and lecturer on materia medica and botany, and director of the microscopical laboratory. C. S. N. Hallberg is lec-

turer on pharmacy, while the laboratory of this department is in charge of Prof. F. S. Hereth. A. G. Manns lectures upon physics and general chemistry, and has charge of the chemical laboratory, while the dispensing laboratory is in charge of Hugo W. C. Martin. On account of the World's Fair the college defer their opening till Oct. 17, this being about the middle of the last month of the Fair, so that students may come a couple of weeks before lectures commence and visit the Fair, or may do this on alternate days during the latter part of the month while both Fair and college are in session. Students should send to W. B. Day, 465 State street, Chicago, for the thirty-fourth annual announcement. The graduates number about 800.

Louisville College of Pharmacy was organized in 1870 by the efforts of the pharmacists of that city, and has continued its work with careful pertinacity more as a duty and labor of love than as a source of profit. Its faculty are L. D. Kasterbine, B. Buckle, O. C. Dilly and O. E. Mueller, with an assistant for each as instructors. The lecture hours are divided so that on Monday and Friday afternoons chemistry and pharmacy are the subjects of consideration, while materia medica and botany are given on Tuesday and Friday evenings. For laboratory work 62 hours in each session is assigned, and is obligatory, the pharmaceutical taking two mornings and chemistry three afternoons each week. The sessions run from September to January, both inclusive, and the Summer session from February to June, inclusive. The Summer session was inaugurated last year at the urgent request of students from the South, and it is more in the nature of an experiment. The total expense of instruction, lectures, laboratory classes and instructors' quiz classes for the two sessions is $145. The last Winter session was attended by 40 juniors and 26 seniors. Of the latter 15 graduated, making the total to date 204 graduates. The present Summer class numbers 26 students. The prizes of gold medals are plentiful, no less than eight being distributed at the commencement in February last. The college requires preliminary examination and thesis. For prospectus address Fred. C. Miller, secretary Louisville College of Pharmacy, Market and Clay streets, Louisville, Ky.

Cincinnati College of Pharmacy was organized in 1871 and in its earlier years had the guidance of an excellent faculty, among whom were J. F. Judge, E. S. Wayne, A. Fennell, J. U. Lloyd and others, and they have worthy successors in the present faculty, C. T. P. Fennell, J. H. Eichberg, A. Leué, C. B. Harvey, O. L. Cameron, T. Wetterstrom and W. Simonson, the two latter being in charge of the pharmaceutical and chemical laboratories. The session lasts a full six months from September to March. There is a Summer course in botany, which is optional, but the course in microscopy and laboratory work is obligatory. Preliminary examination is a requisite for admission and a thesis for graduation. The award of medals for merit is liberal. The expense of the entire two sessions is $135. The lectures and instruction are all given during daylight, the lectures on the afternoons of Mondays, Wednesdays and Fridays, while the laboratories are open for class instruction on four days of the week. For prospectus address W. Simonson, Cincinnati College of Pharmacy, Cincinnati, Ohio.

California College of Pharmacy was organized in 1872, largely through the efforts of Emlen Painter, and W. M. Searby, who gave their services as members of the faculty in order to establish the good work begun. It is well located, a comfortable building, ample in its resources and with an excellent corps of instructors, consisting of William T. Wenzell, H. H. Behr, C. A. Seifert, F. T. Green, J. J. B. Argenti, W. M. Searby, aided by six instructors. The lectures are all given in the morning between the hours of nine and twelve each day excepting Saturday. Microscopy is obligatory, as is also laboratory instruction, in which the junior class receive their instruction during the lecture term, and the senior between the junior and senior terms, commencing about February 1. Preliminary examination, four years' experience and two sessions' attendance on lectures are requisites. The lecture term begins in April and continues until October. Prizes of a gold medal and microscope to the most meritorious of the senior class, and to the junior who attains the highest standing a set of tickets for the senior year, are annually offered. The fees for the two years inclusive are about $172. During the past year there were 66 junior students and 41 seniors, of whom 33 were graduated. The total number of graduates to date is 208. For prospectus address W. M. Searby, 400 Sutter street, San Francisco, Cal.

National College of Pharmacy was established through the active work of the pharmacists of Washington, D. C., in 1872. The medical department of Columbia University had previously been giving pharmaceutical instruction, but on the establishment of this college discontinued it in its favor. The faculty are Samuel Waggaman, Henry E. Kalusowski, Frederick A. Holden and William Hillebrand, aided by instructors. Preliminary examination or a certificate of school examinations equal to the high school of the District of Columbia is required for matriculation. Washington has many attractions for the student besides its natural beauty and society, among which are the libraries, museums, botanical gardens and public buildings. The college is a convenient and well-arranged building, centrally located and admirably adapted for its purpose. The lectures are given in the evenings of Monday, Tuesday, Thursday and Friday. At its recent session there were 46 junior and 24 senior students, and of the seniors 12 graduated, making the total to date 190. During the coming year more time than heretofore will be given to laboratory work. The total expense for the two years' course is $138. For copy of the prospectus address H. E. Kalusowski, 808 I street, Washington, D. C.

The Pittsburgh College of Pharmacy, which was organized in 1878, in its new and commodious quarters, located at the corner of Market and Water streets, Pittsburgh, offers to students excellent facilities for acquiring a thorough pharmaceutical education. The college now has three spacious and well-lighted lecture halls, thoroughly equipped with every convenience and facility for the illustration of all subjects brought before the students. The laboratories are equally large and well lighted, and complete in all their appointments, each table having gas, water, and closets for the storing of apparatus; a separate outfit being furnished each student. A course of lectures on microscopy and a microscopical laboratory have also been lately added.

The college is situated in the heart of the business portion of the city, convenient to all the railroad depots and street railways, making it convenient of access. In the laboratories, as in the lectures, a graded course will be pursued, each student receiving individual instruction and attention. The course in the chemical and pharmaceutical laboratories is obligatory.

The fees for each term are $65, which include matriculation fees, lecture tickets, laboratory fees and quizzes.

The faculty is composed of Adolph Koenig, professor of materia medica and botany; Julius A. Koch, professor of theory and practice of pharmacy; F. T.

Aschman, professor of chemistry ; Gustave Guttenberg, professor of practical microscopy : with the following assistants : A. Herman Poth, in pharmacy ; John A. Shafer, botany and materia medica ; John D. Campbell, chemistry.

The lectures and laboratory work are all done in daylight hours. There is no entrance examination, but at the close a satisfactory examination must be passed before the junior can become a senior. A thesis is required of each graduate. The lecture course covers nearly six months, and will be more complete this coming session than ever before. The number of graduates at last session was 22, which makes the total to date 137. The class numbered nearly 100 students.

The session of 1893–'94 will begin October 2. Write for prospectus to Prof. Julius A. Koch, Dean, P. O. Box 719,Pittsburgh, Pa.

Albany College of Pharmacy.—This college represents the Department of Pharmacy of Union University and was organized in 1881. Its lecture rooms are situated in the building of the Albany Medical College and include chemical and pharmaceutical laboratories fitted out with the most recent improvements. The faculty comprise Willis G. Tucker, Alfred B. Huested, Gustavus Michaelis and F. P. Huested, assisted by three instructors. A preliminary examination is required for matriculation and a thesis for graduation. The lecture course extends from October 5 to March 1, and is so arranged as to provide for evening lectures only, with the exception of Saturday, when an afternoon lecture is given. Laboratory work is carried on during the morning and afternoon, 200 hours in all being devoted to this branch. A more thorough system of quizzes and recitations is to be introduced this year. Two prizes are offered at the close of each term, one of which is for the best examination in each class. Seventeen students were graduated at the last session and the number of senior and junior students at that time was respectively 31 and 25. The total expense of lectures, including all fees, for the two sessions is $124. For prospectus address A. B. Huested, M.D., 144 State street, Albany, N. Y.

Purdue University, located at Lafayette, Ind., became in 1884the patron of pharmacy by the establishment of a department of pharmacy. For years the pharmacists of the State have labored for a pharmacy law, but some political "pull" has prevented them from accomplishing their desire. But this is counteracted in a measure by the establishment of this excellent school of pharmacy. Its faculty are A. L. Green, dean, in charge of chemistry; Stanly Coulter, in charge of botany ; J. W. Stuermer, in charge of pharmacy ; Geo. Spitzer, in charge of prescription work ; and they are aided by competent instructors in each department. During the past session there were 89 students in attendance, including two ladies. Twenty-two graduated last commencement.

Students are engaged at the University about *forty hours* each week ; about two-thirds of this time is devoted to laboratory work, and one-third to lectures.

In all five laboratories are open for the use of the pharmacy class. There are a fine collection of buildings connected with the university, and excellent libraries. The expense for two years' tuition, lectures, laboratory and all expenses of the institution are about $90. For prospectus, address Arthur L. Green, Dean of Purdue School of Pharmacy, Lafayette, Ind.

University of Kansas is located at Lawrence and is under the patronage of the State. The department of pharmacy is under the care of L. E. Sayre, who in 1885 was called to the chair of pharmacy. His associates are E. H. S. Bailey, chemistry and toxicology ; L. I. Blake, physics ; F. H. Snow, botany ; S. W. Williston, anatomy and physiology, and D. H. Robinson, Latin, aided by six instructors. An entrance examination is required, two years' attendance at lectures during the morning hours and laboratory practice in the afternoon. Each term begins in September and continues until June. While the instruction is thorough the expense is shown by ciphers, for it is practically free, the total expense being but nominal. The graduating class, which numbered 16 at the last session, are examined by a board of pharmacists. The chemistry building, which is divided between chemistry and pharmacy, is excellently equipped for work and the student has many advantages in his studies. For prospectus address School of Pharmacy, Lawrence, Kan.

Ohio State University, at Columbus, Ohio, has the school of pharmacy under the control of the faculty of the University, but more directly under the supervision of the Pharmacy Committee. While the pharmacy students have the privilege of many of the lectures on the allied sciences, the portion of the faculty that have the branches most akin to pharmacy are S. A. Norton, chemistry ; N. W. Lord, metallurgy ; N. S. Townsend, materia medica ; G. B. Kauffman, pharmacy ; W. A. Kellerman, botany ; A. M. Bleile, physiology and microscopy, and a corps of assistants as instructors. During the past session there were 38 students and five graduates.

In thelaboratories not less than 30 hours will suffice and the student may utilize 48 hours. The libraries, laboratories, museums, and all facilities of the institution can be availed of by the pharmacy students. The term for graduation covers three sessions or years, of eight months each, and the total fees for the entire course (three years) is not to exceed $100. There is no fee for tuition in any department. For prospectus, address George B. Kauffman, Columbus, Ohio.

Buffalo College of Pharmacy, organized in 1886, has been favored with prosperity, and this is due largely to the enterprise and energy of its faculty and officers. During the past year the college has moved into a large and handsomely fitted new building, which will be jointly occupied by the medical department of the University of Buffalo and the Buffalo College of Pharmacy. Its faculty include : David S. Kellicot, emeritus professor of botany and microscopy ; Enoch V. Stoddard, emeritus professor of materia medica; Rudolph A. Witthaus, emeritus professor of pharmacal chemistry and toxicology ; Willis G. Gregory, professor of pharmacy and director of the pharmacal laboratory ; Ernest Wende, professor of botany and microscopy ; Eli H. Long, professor of materia medica ; John R. Gray, professor of pharmacognosy ; Herbert M. Hill, professor of general and analytical chemistry ; A. L. Benedict, lecturer on botany ; E. Carlton Sprague, special lecturer on medical jurisprudence, and four assistants as instructors. The course covers six months of lectures by the faculty, and is so given that nearly 300 hours are devoted by juniors and over that amount by seniors to the college work of lectures and laboratory. A perpetual ticket, which costs $125, entitles the holder to all the privileges of the college from entering to graduating. Prizes of gold medals and scholarships await the fortunate honor men of senior and junior classes. During the past session the number in attendance was 40 juniors and 20 seniors, of whom 22 graduated, making 117 graduates to date. For prospectus, address John R. Gray, Ph.G., 246 Seventh street, Buffalo, N. Y.

Illinois College of Pharmacy, Chicago, is the Department of Pharmacy of the Northwestern Univer-

sity, and was organized in 1886. During the first seven years of its existence it occupied the rooms vacated in 1886 by the Chicago Public Library. During its first Winter term, 1886–1887, it had sixty-two students, and since that time the classes have grown steadily, until the total annual attendance now approaches four hundred.

On the first of March, this year, the college moved to its new home, a commodious and handsome building, six stories high, and covering 11,550 square feet of ground, located on Dearborn street, between Twenty-fourth and Twenty-fifth streets.

In this new building the college has six separate and distinct laboratories, one of the finest lecture rooms in the country, a museum and library, professors' rooms, and all other needful conveniences.

University of Virginia (Charlottesville, Va.) in 1886, in deference to the pharmacists of the State, provided a department of pharmacy, that the young pharmacists might find "at home" what they had gone elsewhere to find—more information than could be secured by home study or store practice. The faculty consists of J. W. Mallet, chemistry; F. P. Dunington, analytical chemistry and pharmacy; W. B. Towles, materia medica; A. H. Tuttle, botany. Laboratory instruction is daily for nine months, from four to five hours being thus employed, and three hours daily average of lectures. The expense of lectures for the session is $120.

Tulane University of Louisiana, at New Orleans. The medical department established a course in pharmacy in 1837, and in 1887 a very superior pharmaceutical laboratory for the instruction of practical pharmacy in which Albert L. Metz, a native of that city and a graduate of pharmacy of the New York College of Pharmacy, class of '87, is instructor of practical pharmacy. The other lectures are the same as in the medical department. Pharmaceutical students to graduate must have had two years' practical experience in store, present a suitable thesis and pass satisfactory examinations. The expense for the two years is in the vicinity of $155. The school is in a very prosperous condition. The next session opens October 20, 1893. For information or prospectus address Prof. S. E. Chaillé, M.D., dean of the medical department.

Central Tennessee College, Nashville, has its departments of medicine, dentistry and pharmacy grouped into one general, though each are separate departments. These departments are for the benefit of colored young men alone, as in some other educational institutions they are debarred from the privileges necessary to acquire the desired proficiency. The fifth session will open its course of instruction the third Monday of September and continue until February following. Chemical and pharmaceutical laboratories are open for practical work, as well as the accessories of microscopy, urinalysis and toxicology. Its faculty are W. Sevier, pharmacy; W. Osborn and G. W. Hubbard, botany and materia medica; W. Patterson, chemistry, aided by two instructors. The entire expense for the two years is about $75. For prospectus address G. W. Hubbard, Meharry School of Pharmacy, Nashville, Tenn.

Ontario College of Pharmacy, located at Toronto, Ont., originated in the effort to give young pharmacists a preliminary training that would prepare them to meet the requirements of the Pharmacy Act of 1871, but it was not until 1882 that it became a distinct teaching body. In 1887 the college building was erected, and in 1891 re-modeled and increased to twice its former size. The building with its appointments is among the first of similar institutions on the American Continent; its laboratories—representing the greater portion of the building—are well lighted and ventilated, and fully equipped with conveniences and apparatus of the latest design.

Its courses of instruction are exceedingly thorough, and more than half the student's time is devoted to practical work in the laboratories.

The course comprises two terms, the junior session beginning Sept. 14, 1893, and continuing for 15 consecutive weeks, the senior session of 18 weeks beginning Jan. 9, 1894.

The requirements are, preliminary examination, four years' experience in retail store, junior examination and satisfactory final examination. The expense for the whole course is about $100. Board can be obtained in the city from $3 to $4.50. The College is now affiliated with the University of Toronto which confers the degree of Bachelor of Pharmacy (Phm.B.).

The professiorial staff comprises: Dean Chas. F. Heebner, pharmacy and pharmaceutical laboratory; A. Y. Scott, chemistry and botany; J. T. Fotheringham, materia medica and pharmacognosy; G. Chambers, chemical laboratory and toxicology.

For Annual Announcement, address I. T. Lewis, Registrar, Ont. College of Pharmacy, Toronto, Ont., Can.

A free scholarship is competed for by the junior class, and the recipient has the senior course of instruction without expense. The alumni association also awards to two meritorious junior students free laboratory instruction.

Ohio Normal University, at Ada, Ohio, has a department of pharmacy which was established in 1884. During 1891 new and enlarged quarters were provided for the chemical and pharmaceutical laboratories to meet the increased demand caused by large accessions to their class of students. During the week 15 hours are given to lectures and recitations and 30 hours to laboratory work. The faculty of the pharmacy department are B. S. Young, pharmacy and advanced chemistry; E. B. Hall, pharmaceutical chemistry; M. L. Alspach, superintendent of laboratories; J. G. Park, botany and pharmacognosy; H. S. Lehr, dean of the faculty. The total expenses for the full course for all lectures, laboratory and dispensing work is $60, and room rent and board is $80 additional. The course extends over 40 weeks. For prospectus address H. S. Lehr, or B. S. Young, Pharmacy Department, Ada, Ohio.

Iowa University, Department of Pharmacy, is located at Iowa City, Iowa, and was organized in 1885. During 1891 a new building, costing $50,000, was occupied by the departments of pharmacy and chemistry. Erected specially for this purpose, it was constructed with the most modern improvements in all respects. Lectures and laboratory work are in the day time, and students are kept busy from 8 A.M. to 6 P.M. The libraries, with over 20,000 volumes, are accessible during these hours, as are also the museums and some departments of lectures in the university proper. Preliminary examination or its equivalent is necessary for entrance. Two years' work in the chemical and pharmaceutical laboratories and, including the college work, four years in pharmacy, with satisfactory final examinations, are necessary to secure the degree of Ph.G. The faculty are E. L. Boerner, pharmacy and pharmaceutical laboratories; C. S. Chase, materia medica; L. W. Andrews, chemistry and chemical laboratories; T. H. McBride, botany; E. W. Rockwood, texicology, aided by instructors. The expense of the junior course is $71, and the senior course is $76.

Laboratory work is divided into chemical, pharmaceutical, botanical and microscopic, and is very full in all its details. For further particulars and prospectus address E. L. Boerner, Iowa University, Iowa City, Iowa.

Kansas City College of Pharmacy was organized in 1886, and the same year instruction in pharmacy was begun. During the past year there were in attendance 102 students, 17 of them graduating. The total number of graduates to date is 71. Its laboratories are well fitted and convenient, and 12 hours' work are here required from each student. The lectures are given on three evenings of the week and laboratory work in the afternoons. Its faculty are E. Lanphear, materia medica; R. R. Hunter, chemistry; J. G. Kiefer, botany; W. T. Ford, pharmacy; C. C. Hamilton, demonstrator of chemistry, and H. W. Maloney, demonstrator of pharmacy, the two latter in charge of the laboratories. Preliminary examination is required, two sessions attendance on lectures, laboratory work, including microscopy, thesis and satisfactory examination, to attain the degree of Ph.G. The lecture session opens in October and continues nearly six months. The total expense for all instruction and fees is about $105. Prizes of gold and silver medals to both senior and junior students are usually made. For prospectus address W. T. Ford, 1305 Cherry street, Kansas City, Mo.

Denver College of Pharmacy is a department of the University of Denver, organized in 1887, having a corps of teachers entirely distinct from all other departments of the university. Thus far the attendance has been limited largely to the young pharmacists of Denver and surrounding cities, but ought to embrace a much larger number. Its excellent faculty comprises J. A. Sewall, chemistry; C. M. Ford, pharmacy; J. Kochan, botany and materia medica; J. P. Kinley, microscopy; L. Wallien, in charge of laboratory, and E. Ackerman, J. A. Marlin and T. A. Lyneman as instructors, respectively, in pharmacy, chemistry and materia medica. The lectures are given in the evening, chemical laboratory accessible all day. The expense for two courses, including matriculation and graduating fees, is $115. Preliminary examination is required. Students have many privileges of the university without extra expense. For fuller information address Prof. J. Kochan, P. O. Box 2667, Denver, Col.

Department of Pharmacy of Scio College.—This is a department of Scio College, an educational institution under the control of the Methodist Episcopal Church, and is located at Scio, Ohio, on the Wheeling & Lake Erie and the Pittsburgh, Cincinnati, Chicago & St. Louis railroads. The department of pharmacy was added in 1890, and possesses a full complement of laboratories and equipments. The equipment has lately been materially increased by the addition of a complete drug store, designed exclusively for the purpose of affording practice in dispensing. All laboratory work is obligatory, and averages 18 hours per week throughout the course. The regular course leading to the degree of graduate in pharmacy has been extended to two years, and one year in medical and pharmaceutical Latin has been added to the course. Candidates for graduation must possess a common English education, and all diplomas are withheld until the candidate has passed the examinations of the Ohio Board of Pharmacy. Beginning with the present year, two years of actual experience will be required in addition to the college course. Students in pharmacy are admitted to the other departments of the college for the purpose of making up deficiencies in English education, and to the classes in conversational German without extra charge. The college fees are $60 per year. The faculty of instruction are as follows: J. H. Beal, chemistry and pharmacy; W. G. Compher, botany and microscopy; J. M. Adams, materia medica; Otto Sahli, Latin and German, and an assistant instructor in each of the laboratories. For prospectus address J. H. Beal, principal, Scio, Ohio.

Oregon College of Pharmacy, at Portland, Ore., is a branch of Willamette University, which was organized in 1889. As it draws its students from that State and has not as yet received the cordial help it deserves, its classes have been meager compared to what they might be, if even the pharmacists of that city were to send all of their employees who ought to be there. It has every facility that the older colleges have, laboratories, etc., and should have a better clientage of students by a score or so. Let Portland and Oregon druggists see to it that they do their clerks and themselves, as also the college, the justice to send more students during the next session. The expense of two sessions of six months each, with other fees, cost about $112.50. For fuller information address Oregon College of Pharmacy, Portland, Ore.

Detroit College of Pharmacy, which was organized in 1890, has very desirable and commodious quarters in the new building of the Detroit College of Medicine, large and convenient rooms being used for the pharmaceutical students for lectures and laboratories. The lectures and part of the laboratory work is done in the evenings. Preliminary examination or its equivalent is necessary to enter; mid winter as well as final examinations are given, and for final success the standing is based on attendance and standing in recitations, diligence and success in practical work, proficiency in final examination. Good character, 21 years of age, two full terms at college of pharmacy are necessary, as well as the previous requirements stated. The faculty are: J. E. Clark, chemistry; E. J. Kennedy, pharmacy; G. Suttie, botany; L. H. Gardiner, materia medica and pharmacognosy; E. C. Skinner, pharmacal jurisprudence, with assistants in chemical and pharmaceutical laboratories and dispensing department. The expense of the two sessions is about $100, with opportunities of extra chemical work if desired. The session fills seven months. For prospectus address E. C. Skinner, Detroit College of Pharmacy, Detroit, Mich.

Atlanta College of Pharmacy was opened in 1891, and though young in years means good work now and always. It had last Winter 15 students graduating, one who took his second course in that college. The comfortable building in which its quarters are installed gives ample facilities for lectures and laboratory work. The faculty are H. V. M. Miller, dean; W. S. Kendrick, proctor; George F. Payne, materia medica, and toxicology; L. H. Jones, theoretical and analytical chemistry; W. H. Inghram, theory and practice of pharmacy and of botany. The first session involves an expense of $45, and the second session of $60. Special class in laboratory work is extra. The candidate for graduation must be possessed of a good moral character and have attained the age of 21 years. He must have attended two full courses of lectures in some reputable college of pharmacy, the last of which must have been in this college, have passed a satisfactory examination in each department, and have had a practical experience of four years in pharmacy, including the period of attendance at college. It is believed that the central location of this college will attract increasing numbers of students from adjacent Southern States. For prospectus address Dr. W. H. Inghram, 341 Marietta street, Atlanta, Ga.

Minnesota College of Pharmacy is a department of the State university, the first course in which closed in June of this year. For admission a certificate or diploma of graduation from a high school is required or in lieu thereof the candidate must pass a preliminary examination. Of the applicants for entrance last Fall only 25 were successful in reaching the required grade. The curriculum embraces a special course in pharmaceutical mathematics. The course of lectures and laboratory work extends over 18 full months. The faculty embrace Frederick J. Wulling, dean, lecturer on pharmacy and director of the pharmaceutical laboratory; C. J. Bell, professor of chemistry; H. H. Bracken, professor of materia medica; C. MacMillan, professor of botany; R. O. Beard, professor of physiology; H C. Staples, instructor in pharmaceutical Latin, and J A. Dodge, professor of organic chemistry. The expenses for each session including laboratory fees, etc., amount to about $75. For prospectus address F. J. Wulling, Minnesota University, Minneapolis, Minn.

Chattanooga College of Pharmacy.—A pharmaceutical department was organized in 1892 as a department of the Grant University, though managed as a separate and distinct institution. It enters upon its second year with a careful and well selected faculty, among whom are W. A. Applegate, Harry Wise, S. W. Prewitt and M. Block. The session opens and lasts six months.

The requisites for admission are the same as those of all other recognized colleges of pharmacy. The entire expense for the two sessions, including diploma fee, is $110. The lecture and laboratory hours are to be so arranged as to afford students free opportunity to fill active positions in drug stores in the city, if such is their desire. For prospectus and further information address Harry Wise, 709 Market street, Chattanooga, Tenn.

(To be Concluded.)

Pharmacy in Germany.*

"The eyes of all Europe are on Germany. The thinker looks here for appreciation of his thoughts; the dreamer looks to us for the realization of his dreams; the scientists, the men of letters, the sweet singers, and the graceful painters of every country and every tongue look to the great empire of the Teuton for leadership, encouragement and inspiration."—*Kaiser Wilhelm II. at Bonn.*

So spake William, the third Emperor of the Germans; and to the branch of science to which pharmacy belongs his words are peculiarly appropriate, for English chemists may well look to the "Happy Fatherland" for the realization of their most extravagant hopes, as in Germany, and in Germany alone, their art is recognized as an important scientific pursuit, their interests are jealously guarded by the State, their position is freed from much of its commercialism, and competition from outsiders is quite unknown.

While on a recent visit to Hamburg I managed to secure the necessary information concerning the *statu quo* of our German colleagues to enable me to write this short sketch. Hamburg is a typical German town of some 300,000 inhabitants, situated on the river Elbe about 75 miles from its mouth.

It is a gay, bustling place with a quaint Altstadt of picturesque houses, tortuous streets, and sluggish canals, and a fair stately Neustadt enclosing the Binnen Alster, upward of a mile in circumference, and girt on three sides by well-kept quays, planted with trees, and flanked by lines of splendid mansions, hotels and shops. In one of these shops I found a friend in Herr Carlos Bonhoff, a learned young Teuton from Casel, in the Rhineland, who spoke ten languages, had been an assistant in Fenchurch street, and knew every capital of Europe as well as his own beloved Berlin. I had met him years ago in Dublin on a visit to his sister, a well known teacher in the fair Irish capital, and when I stumbled across him one day in the land of sauerkraut and sausages my heart was glad within me. He brought me to his pharmacy, which was more like a museum than a shop. Everything looked so neat and tidy, and was so carefully stowed away in velvet and beveled glass that one would almost think it sacrilege to ask one of the sad-eyed, spectacled, sallow-cheeked assistants, who glared at the customer from behind the high, carved oak counter, to part with one of the neatly labeled bottles or boxes out of the carefully locked cases. The customers seem to feel that a great honor was being conferred on them by being allowed to stand in the presence of Herr *Apotheke*, for they invariably stood in the dim æsthetic light of the shop, with heads uncovered, and hushed voices waiting uneasily to be attended to, then hurrying rapidly away from the dread presence of the Dispenser of Deathly Drugs. Indeed, how could one feel comfortable in a great cheerless hall fitted in carved oak and pitch pine, with somber cases and rows of queer-looking surgical appliances, suspicious-looking, odd-shaped bottles ranged round the walls, covered with cabalistic figures and interspersed with the curious instruments of the alchymists' laboratory, and "huge, musty tomes of old forgotten lore?" It is all very grand and very stately, your old-world German pharmacy, but, myself, I confess to not feeling very comfortable in it, and finding myself comparing the museum-like stiffness of its arrangements with the enterprising lavishness of some Oxford street and city shows, to the no great advantage of the former. Having inspected the shop and the perfectly equipped laboratory behind it, Herr Carlos introduced me to his study or retiring room—an elegantly-fitted room opening off the dispensing department. Here, on many successive evenings, we discussed politics, science, music, drama and sport, and I was given the following *résumé* of the pharmacy laws of the cynosure of Europe, as Emperor William calls his empire.

As previously stated, pharmacy in Germany is practically a learned profession, and like every other professional pursuit, the entrance to the land of pill-makers is jealously guarded by regulations and curricula which leave the pharmaceutical tyro mighty little option as to the *modus procendi.*

In Germany the pharmaceutical student must produce a certificate from the State schools showing that he has year by year and term by term studied earnestly and diligently the following subjects, and at all times and at the various examinations satisfied the State inspectors that he possessed a sufficient knowledge of them, *viz.*:—Latin, German, mathematics, grammar, geography, history of Germany and Europe, French, English (in many schools), natural history, including zoology and botany, chemistry, natural philosophy, including dynamics, pneumatics, light, sound, heat and electricity.

Provided with this certificate the pharmaceutical student must find some *apotheke* who will receive him as an apprentice.

Unlike Great Britain, where apprentices are scarce and in great demand, students are plentiful in Germany and masters few.

Frequently the aspirant to pharmaceutical honors will find himself utterly unable to find a master unless he has from 500 to 2,000 marks to invest, in which case, of course, he has not much difficulty. If he is willing to pay a premium, of the latter sum in particular, he

* Selections from an article by Dr. R. J. Blackham in the *British and Colonial Druggist.*

may even aspire to an establishment with the royal arms of the great house of Hohenzollern over the door. Having found a vacancy, the German aspirant to pharmaceutical honors binds himself to serve faithfully, honestly and well his master, and to be guided by him in his studies for a period of not less than three years. Nor must he waste much time, for at the termination of his apprenticeship he has to present himself for the first special examination for *apotheke*. The subjects of this examination are :

1. *Prescription reading* and prescription writing, including (*a*) the reading of autograph prescriptions without abbreviations, (*b*) the detection of errors and unusual doses, (*c*) the posology of the materia medica, and (*d*) the writing of prescriptions in the technical form from dictation.

2. *Practical dispensing*, including all the various manipulations which may at any time be required from the practical pharmacist.

3. *Pharmacy*, including the recognition of the commoner preparations of the National Pharmacopœia.

4. *Materia medica*, including (*a*) the recognition of the roots, barks, leaves, fruits, resins, gums, animal substances, etc., used in medicine ; (*b*) the botanical and zoological names of the plants, etc., yielding them, the natural families to which they belong, and their habitats ; (*c*) the recognition of their purity ; and (*d*) the formulæ of their preparations. It is also desirable that candidates should possess a practical knowledge of the methods of estimating the value of important drugs, and of obtaining their active proximate constituents in a pure state.

5. *Botany*, including the recognition of all the important orders and their members used in medicine, classification, and the morphology and physiology of plants.

6. *Chemistry*. Candidates are expected to possess a very extended knowledge of theoretical organic and inorganic chemistry, and more especially the application of the science to medicine, the preparation of the chemicals used as drugs, and the results of chemical products on the human economy.

They are expected to be able to conduct any *qualitative* or volumetric analysis, but *quantitative* work is not yet included in the curriculum.

7. *Natural philosophy*, including a general knowledge of the laws of natural philosophy, the working of simple problems, in experimental physics, a practical knowledge of the commoner instruments used in physics for the determining of specific gravities, temperatures, densities, etc., and a sound knowledge of light, sound, heat, electricity and magnetism, and the appliances used in these sciences.

8. *Toxicology* or the recognition of the effects of poisons, and the suitable antidotes.

9. *Microscopy*, as applied to pharmacy.

10. *Urinalysis*.

The examination is written, oral and practical, and usually occupies the greater part of the week. The examination in these subjects over, the student proceeds no further in his studies until he has served for a period of three years as assistant to a registered *apotheke*.

Having completed his six years' service as apprentice and assistant the student is compelled to enter one of the many universities of the empire. The course of study which must, according to law, embrace three *semestres* or sessions, of at least six months' duration, includes :

1. Organic and inorganic chemistry.
2. Analytical chemistry, qualitative, volumetric and quantitative.
3. Botany.
4. Natural history.
5. Materia medica.
6. Therapeutics.
7. Toxicology, including forensic analysis, analysis of food, drinks, drugs and tobacco, etc.
8. Microscopy in its pharmaceutical, medical and legal aspects.
9. Natural philosophy.

All of these subjects are studied in the thorough fashion that work is always done at a German college, not only from works of the first authorities, but also practically.

This means two years of constant toil in the laboratory and lecture theater, at the conclusion of which comes the final examination for the title of *apotheke*.

This examination embraces all subjects studied, and lasts from six weeks to two months. It is about as difficult as the examination for the degree of Bachelor of Science of the University of London, the candidates being examined first by papers, then orally, and again practically, in each branch of science included in the curriculum.

Having passed through this ordeal, which is a "*Staats examen*" conducted by examiners appointed by the Crown, and under the direct supervision of the government, the successful candidate is granted a diploma which entitles him to conduct a business provided he can obtain a license or permit from the German Home Office to establish a pharmacy in a certain house in a fixed neighborhood.

Unfortunately, however, licenses are very scarce, and the applications for them may be numbered in thousands, so that the only feasible way of procuring a business of one's own is to buy an established license. For this a capital of between £1,000 and £10,000, English currency, is usually required; it is, therefore, evident that pharmacy in Germany is not a pursuit suitable to poor men, and is not, as in England, the *refugium peccatorum* of the artisan's weakly son.

There are, of course, some poor men in the profession in Germany, but their fate is not a very bright one, as they have to be content with the position of assistant, or enter some of the allied businesses, which are not so strictly preserved as the demesne of Herr Apotheke.

Provided he has the necessary capital to buy his business, the prospects of a chemist in the Rhineland are very rosy, as dispensing and general prices are very good.

The following price list is the rate fixed by the Crown for most towns in Northern Germany :

	Marks.	Pfennigs.
Mixtures, 8 ozs.	1	80
Mixtures, 6 ozs.	1	50
Mixtures, 2 ozs.	1	20
Pills, per doz.	½ to 1	0
Liniments, per ounce.	0	40 to 80
Lotions, per ounce.	0	20 to 30
Syrups, per ounce.	0	40 to 60
Powders, per dozen.	1	50
Blisters.	½ to 1	0
Plasters, usual size, for back.	1 to 2	0
Inhalations per ounce.	0	60 to 80
Granular preparations, per ounce.	0	40 to 80

"Cutting" in the sale of drugs is quite unknown, and the usurping of chemists' rights by grocers, a thing unheard of under the Black Eagle of United Germany. That execrable offspring of the meanness and commercialism of the British practitioners of what might be a learned and honorable calling—the "profitable extra"—is, of course, quite beneath the notice of our fortunate German colleagues. Assistants, as would be expected, are in good request, but the supply far exceeds the demand. They are no better paid than at home, perhaps a little worse. The salary of a manager ranges from 1,500 to 2,000 marks per annum, while juniors receive from 500 to 1,000.

Notes, Queries, and Answers.

We shall be glad, in this department, to respond to calls for information bearing on pharmacy or any of its allied topics, and cordially invite our friends to make use of this column.

When sending for the formula of an unusual, patented or proprietary compound, the query should be accompanied with information regarding the locality in which it is used, its uses, and reputed effect. When it can conveniently be done, a specimen of the label used on packages of the compound should also be sent.

Moselle Syrup.—L. G., Binghamton.—This, like a host of similar titles, is a fanciful term applied to a liquor syrup. It had quite a vogue at one time, and with capillaire and decoctions of a like nature sold well. Here is a recent formula for its preparation:

Citric acid	ʒ i
Angostura bitters	fl. ʒ i
Essence of lemon (soluble)	fl. ʒ i
Essence of vanilla	fl. ʒ ss
Caramel	fl. ʒ i
Simple syrup	fl. ʒ xx.

Mist. Ol. Lini (Thompson).—Subscriber, N. Y. The formula given below is taken from Prof. W. H. Thompson's work on Materia Medica.

Linseed oil	fl. ʒ xv
Oil gaultheria	
Oil cinnamon (cassia	♏ aa fl. ʒ ij
Irish moss	ʒ iv
Water	fl. ʒ xxiv
Glycerin	fl. ʒ v
Syrup	fl. ʒ x
Dilute hydrocyanic acid	fl. ʒ ijss.—M.

Make a mucilage with the Irish moss and water, and with this emulsify the oils; mix the hydrocyanic acid with the glycerin and add to the emulsion; lastly, add the syrup and mix thoroughly.

Pomegranate Syrup.—E H. Santa Barbara, Cal.—The *National Druggist* gives the following as a modification of the formula of the *Deut. Dest. Zeit.* First make grenadine essence, as follows:

Oil of sweet orange	3 parts
Oil of clove	1 part
Tincture of vanilla	15 parts
Tincture of ginger	10 parts
Maraschino liquor	150 parts
Tincture of coccionella	165 parts
Distilled water	150 parts
Phosphoric acid, dilute	46 parts
Alcohol, 95%	810 parts

Mix and dissolve.

To make the syrup, add 1 part of the essence to 50 parts of simple syrup, and dissolve in the mixture 1 part of citric acid.

The Drug Journals of the United States.—L. W. M., Mo., requests us to publish a list of the drug journals published in the United States.

The list given below is compiled from the exchange list of the AMERICAN DRUGGIST AND PHARMACEUTICAL RECORD as follows:

American Journal of Pharmacy, Philadelphia, Pa.; *Deutsch-Amerikanische Apotheker Zeitung*, New York, N. Y.; *Merck's Market Report and Pharmaceutical Journal*, New York, N. Y.; *Meyers Bros'. Druggist*, St. Louis, Mo.; *Notes on New Remedies*, New York, N. Y.; *The Apothecary*, Chicago, Ill.; *The Bulletin of Pharmacy*, Detroit, Mich.; *The Druggists Circular and Chemical Gazette*, New York, N. Y.; *The Drugman*, Nashville, Tenn. *The Graduate*, Chicago, Ill.; *The Indiana Pharmacist*, Indianapolis, Ind.; *The National Druggist*, St. Louis, Mo.; *The New England Druggist*, Boston, Mass.; *The Pacific Druggist*, San Francisco, Cal.; *The Pacific Drug Review*, Portland, Ore.; *The Western Drug Record*, Kansas City, Mo.; *The Western Druggist*, Chicago, Ill.,

Intensifying Negatives.—G. A. S., Lowville, N. Y.—Plates which require intensification are treated to a bath of bichloride of mercury in watery solution followed by similar solutions of chloride of ammonia, and sulphite of soda, as follow:

1.

Hydrarg. chlor. corros.	
Ammon. chlor. aa	grs. 240
Aqua destillata	fl ʒ xx

2.

Ammon. chlorid	ʒ i
Aqua destillata	fl. ʒ xx

3.

Sodii sulphit	ʒ i
Aqua destillata	fl. ʒ ix.

Immerse the plate in solution No. 1 allowing the fluid to flow evenly over it until the negative becomes white; then drain the plate and immerse it for one minute in solution No. 2; wash off and pour over or immerse in No. 3 until changed entirely to a dark brown or black. A weak solution of iodide of potassium and hyposulphite of soda may be used in place of the chloride of ammonium in solution No. 2.

Diarrhœa Mixtures.—R. Klemm, Brooklyn, N. Y.—The apothecaries attached to the different city hospitals keep in stock what is termed a "house mixture." At "Roosevelt" "chalk and catechu mixture," composed as follows, is used in the treatment of ordinary attacks of diarrhœa:

CHALK AND CATECHU MIXTURE.

Tincture of opium	7½ minims
Chalk mixture	1 fl. dram
Compound tincture of catechu enough to make	2 fl. drams

In the Department of Public Charities and Correction, (Bellevue and the City Hospital) the formulas given below are in constant employment:

SUN DIARRHŒA MIXTURE.

Tincture of opium,
Tincture of capsicum,
Tincture of rhubarb,
Spirit of camphor,
Spirit of peppermint, each equal volumes.

Mix and filter; dose, ʒ i.

LOOMIS' DIARRHŒA MIXTURE.

Tincture of opium	½ fluid ounce
Tincture of rhubarb	½ fluid ounce
Compound tincture of catechu (U. S. P.)	1 fluid ounce
Oil of sassafras	20 minims
Compound tincture of lavender, enough to make	4 fluid ounces

Mix; dose, ʒ j.

SQUIBB'S DIARRHŒA MIXTURE.

Tincture of opium	½ fluid ounce
Tincture of capsicum	1 fluid ounce
Spirit of camphor	1 fluid ounce
Purified chloroform	180 minims
Alcohol, enough to make	5 fluid ounces

Mix; dose, ʒ ss to ʒ j.

Where bismuth is indicated the following finds favor:

COMPOUND BISMUTH MIXTURE.

Subnitrate of bismuth	½ ounce
Camphorated tincture of opium	½ fl. ounce
Chalk mixture, enough to make	4 fl. ounces

Mix; dose, ʒ ii.

Mercurial Ointment.—"Ungt.," Brooklyn, N. Y.—"Calomel is decomposed by the addition of solution of potassa and the precipitate formed after being washed and dried is mixed with lard to form mercurial ointment. Can you give me a formula? I saw the ointment made in this way once, but was unable to obtain particulars. As to whether this will form a true ointment of mercury, I cannot tell; if it does it is a superior method to the one formerly in use."

An ointment corresponding to the mercurial ointment of the U S. Pharmacopœia cannot be prepared according to the method described by our correspondent, owing to the simple fact that the precipitate produced on adding solution of potassa to mercurous chloride is not metallic mercury, but an oxide of the metal. The mercury in mercurial ointment exists in it in a state of minute division and not of chemical combination, as is erroneously supposed by many persons. That a certain amount of the metal becomes oxidized in the process of preparing the ointment, it is not questioned, but

the proportion is trifling, seldom amounting to more than one per cent. It has been shown that an ointment made by merely mixing lard and black oxide of mercury does not possess the same therapeutic properties as the simple combination of lard with metallic mercury.

Cement for Pestles.—F. L. D., Mo., requests a formula for cement to fasten wedgewood pestle handle.

Try the following:

Rosin	180 parts
Burnt umber	30 parts
Calcined plaster	15 parts
Boiled oil	8 parts

Melt the rosin over a slow fire and incorporate the remaining ingredients, adding the oil first.

Modene.—J. A. C., Ohio, asks if we have ever published a formula for the compound bearing this name. We have not, but judging from reports we have had regarding the substance, it cannot possess much potency. We should regard it as one of the numerous army of preparations which are best tested before being purchased. It is almost an impossibility to prepare a liquid hair remover or depilatory which will accomplish its end without seriously interfering with the condition of the skin.

Removal of Hydrastin Stain.—C S. B., New York.—Our correspondent has stained a light colored coat with a mixture containing hydrastin or ebrberine, and wishes to know how he should proceed to remove the spot.

The berberine is the probable cause of the stain, and to remove it we would suggest the application of a dilute acid solution, preferably acetic acid, followed by the application of warm chlorine water, which in turn should be washed away with plenty of plain water.

Wine Presses.—J. F. B., South Carolina, requests the name and address of manufacturers of wine presses for making small quantities of wine.

Apparatus of that description can be obtained from J. L. Haden & Co., Cincinnati, O., and A. B. Farquhar & Co., 77 Cotton Exchange, New York.

Corn Cures.—F. H. Conn. desires formulas for liquid and Russian corn cures.

LIQUID CORN CURE.

I

Caustic potash	ʒ i
Alcohol	fl. ʒ i

Dissolve.

Moisten the corn with the solution which will gradually remove the hardened integument and cause the corn to disappear without pain.

RUSSIAN CORN CURE.

Salicylic acid	30 grains
Extract of Indian cannabis	5 grains
Collodion	240 grains
Alcohol	q. s.

Dissolve the extract of Indian hemp in a few drops of alcohol, then add the solution to the collodion, in which the acid had been previously dissolved.

Corn Salve.—J. C. D, Penna.—The following, which is accounted excellent, is credited to C. W. Moister.

CORN SALVE.

Yellow wax	6 ounces
Venice turpentine	¾ ounce
Pure resin	¾ ounce
Salicylic acid	½ ounce
Balsam of Peru	½ ounce
Petroleum	1 ounce

Melt over a water bath. Stir until cool.

"Hanson's Magic Corn Cure," about which you inquire, is said to have the following composition:

Simple cerate	1 ounce
Salicylic acid	1 dram

Colored Fires.—N. L. W., New York.—The formulas about which you inquire appeared in the *Pharmaceutical Record*, June 16, 1892. From these we make the following selection:

WHITE FIRE.

Potassi nitrate	8 ounces
Charcoal	½ ounce
Shellac (coarse)	2 ounces

BLUE FIRE.

Potass. nitrate	8 oz.
Antimony sulphide	4 oz.
Zinc (metallic, in fine powder)	2 oz.

RED FIRE.

Strontium nitrate	8 oz.
Potass. chlorate	2 oz.
Shellac (coarse)	2 oz.

ROSE FIRE.

Potass. nitrate	8 oz.
Corn meal	2 oz.
Charcoal	½ oz.

VIOLET FIRE.

Potass. nitrate	3 oz.
Potass. chlorate	3 oz.
Shellac	2 oz.
Chalk	2 oz.
Charcoal	¼ oz.

GREEN FIRE.

Barium nitrate	6 oz.
Potass. chlorate	1 oz.
Shellac (coarse)	2 oz.

Bibliography.

THE MANUFACTURE OF LIQUORS AND PRESERVES.—Translated from the French of J. De Brevans, Chief Chemist of the Municipal Laboratory of Paris. With sixty-five illustrations, $3. New York: Munn & Co., 1893.

The people of France have always excelled those of other nations in the concoction of palatable essences and *liqueurs* and France may without undue exaggeration be said to be the home of the more noted of this class of aromatic compounds. Their manufacture is indeed an industry of no mean proportions, which with the conservation of fruits gives employment to a large number of people.

The work before us has been compiled for Frenchmen by a Frenchman and the author has confined himself almost wholly to the methods and apparatus used in his native country, with reference to the operations of distilling, extraction of essences, the manufacture of aromatic wines and hydromels as well as the detection of adulterations and the analysis of alcohols, sugars and syrups. Although this limitation of field as to source of information regarding formulas, apparatus, etc., tends to circumscribe the author's views and to render the book almost provincial in its tone and scope, the work is nevertheless one of much value and well calculated to serve as a guide to the preparation of the numerous compounds which receive mention in its pages.

Although the compilation is intended primarily for liquor manufacturers, the formulas given for the various fruit syrups, sugars, essences, aromatic waters and artificial liquors will prove of great value to druggists and confectioners and should replace to a great extent many of the hastily compiled and inferior manuals which have appeared in recent years to the affliction and disappointment of unsuspecting purchasers. With this explanation we unhesitatingly commend the work to all who are interested in the preservation of fruits and the production of fruit syrups.

The book contains a preface by Ch. Girard, Director of the Municipal Laboratory of Paris, and is embellished with sixty-five illustrations, of which the greater number are figures of machinery and apparatus used

in the manufacture of alcoholic preparations and syrups, the remainder being descriptions of the various aromatic plants which find mention throughout the work.

MISCELLANEOUS FORMULAS.

BOUGIES FOR INCIPIENT GONORRŒHA.

[M. WEBER, *Sem. Med.*]

Gum arabic in powder	15 pts.
Lactose	5 pts.
Glycerin	1 pt.
Iodoform	2 to 4 pts.

Make ten bougies 13 cm. long.

EFFERVESCENT IRON LACTATE.

[P. CESARAIS *Bollet Chim. Farm.*]

Iron lactate	20 grammes
Citric acid	40 grammes
Sodium bicarbonate	80 grammes
White sugar	30 grammes

Heat the mixed powders in a water bath to 100° C when the whole will swell up and assume a fine granular form. The preparation is very hygroscopic and should therefore be preserved in air-tight receptacles. The taste is very agreeable.

GLYCERIN SUPPOSITORIES.

[D. BON, *Giornale farmaceutico Trentino.*]

Glycerin	10 grammes
Water	5 grammes
Gelatin	1 gramme

Melt by a gentle heat and pour into molds. When cold dip into a mixture of melted cacao butter and white wax.

TEETHING SYRUP.

(Chemist and Druggist.)

Ol. anethi	mviij
Sp. am. co.	℥ ss
Mag. carb.	ʒ j
Aq.	℥ iv
Filter and add—	
Sod. brom.	ɔ iss
Pot. bicarb	℥ ss
Tr. card. co.	ʒ s
Syr. rhead. ad.	℥ vj

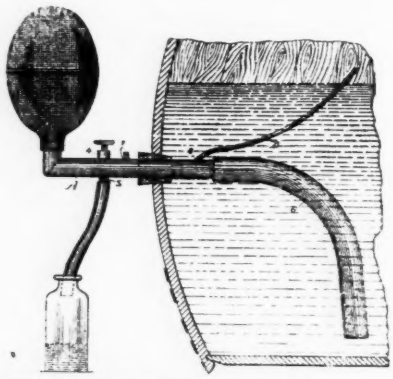
Under six months ½ teaspoonful; above six months 1 teaspoonful.

Novelties and New Inventions.

Under this heading we will be pleased to insert, free of charge, a description and illustration of novelties and new inventions of interest to the drug trade.

Bottle-filling Device.

Joseph H. Stallings, of New Orleans, La., has patented the bottle-filling device shown herewith, the abstract of specifications reading as follows:



Claim.– 1. A filling-device comprising a main tube formed with an outlet pipe, a collapsible bulb on the outer end of the main tube, a valve to close the outlet pipe, a flexible tube on the inner end of the main tube an air-pipe in the main tube and extending upward at the inner portion thereof, and a packing around the main tube behind the outer open end of the air-pipe, all combined and arranged as set forth.

2. A filling-device comprising a main tube formed with an outlet pipe, a valve to close the outlet pipe, a flexible tube on the end of the outlet pipe, an air-bulb on the outer end of the main tube, a flexible tube on the inner end of the main tube, an air-pipe opening through the main tube and extending upward and rearward, and a packing around the main tube behind the outer open end of the air-pipe, all as set forth.

A Practical Way of Making a Decoction.

In a paper read by S. F. Hughes, Ph.G., at the semi-annual meeting of the California Pharmaceutical Society, San Francisco, attention was called to a coffee pot, patented by N. D. Sickles, of San Francisco, as a capital apparatus for making a decoction, in a quick, clean and handy way. After experimenting with it, he finds it works like a charm. This pot, as

the cut shows, can be made of granite ironware, which is much better for pharmaceutical work than tin.

Place drug in hopper, and water in compartment A; then place on stove, and when heated, menstruum will move up to F and flow through drug.

A Perfected Tooth Powder Bottle.

The accompanying cut illustrates an improved form for tooth powder bottles that must at once commend itself to every practical pharmacist. The bo tle was introduced some months since by John M. Maris & Co., of Philadelphia, and a patent applied for, but it is only quite recently that the invention has been so perfected that it could be placed on the market.

The nickel-plated screw cap and bottom give the bottle a very attractive appearance, the latter feature being particularly useful as well as ornamental. The bottom is of spring brass and when pressed by the finger the powder is thrown out. When empty the screw bottom can be removed and the bottle filled with ease and dispatch.

Written for the American Druggist and Pharmaceutical Record.

TIPS ON ADVERTISING. IX.

The Three-Cornered Store in General.

(And One in Particular.)

BY EDWARD A. HAY,

Of H. H. Hay & Son, Portland, Me.

The lack of any attempt at plan in laying out many of the older cities, as well as the intentional design of some of the modern ones, brings two streets together at less than a right angle. This fact is accountable for the odd-shaped junction-corners, flat iron stores, heaters, three-cornered stores, as they are variously termed. Their conspicuous position, frequently at the confluence of several streets, and their resemblance many times, with modern plate glass, to a huge show case, makes them quite desirable as drug stores. A prominent location has so much to do with the business of a pharmacy.

Any one who has considered for a moment their odd shape can but conceive the difficulties that confront the man fitting and arranging such a store. Everything planned to lighten the burdens of the caterer to men's comfort and pain easing, must be specially fitted to the odd shape. The counters, the shelving, even the decoration of the ceiling or the tiling of the floor must be in pattern to harmonize.

In spite of these facts, few cities are without these three-cornered drug stores. Hence such places must have advantages as well. Let us look for a few of them.

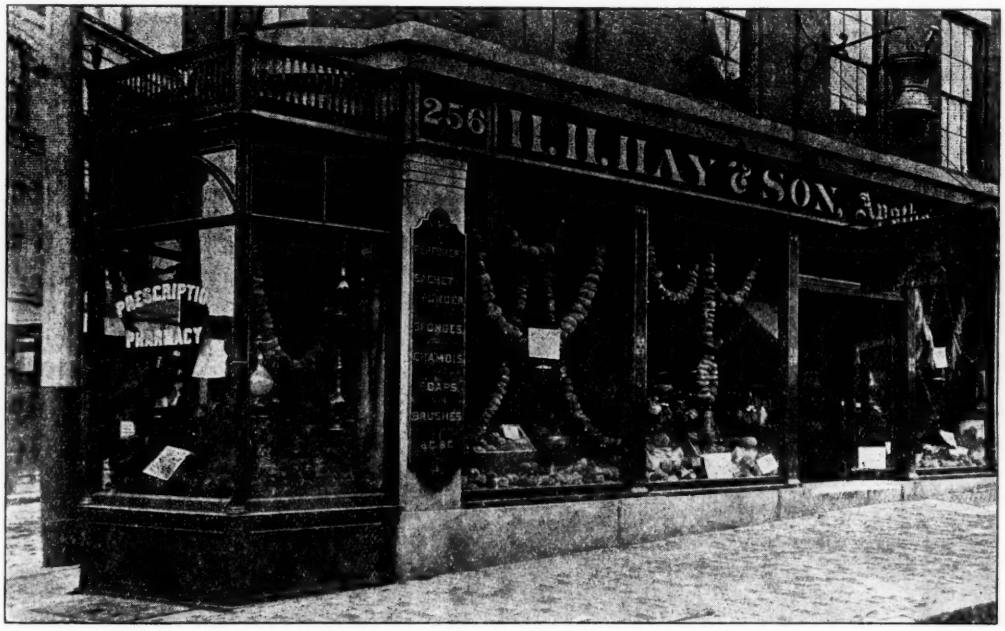
First we have individuality.

The transient or occasional distant resident customer puts no effort into remembering your store apart from all others in your vicinity. Exterior shape is bound to impress, and if by unique attractive arrangement you make that impression favorable inside, much of the desired end is attained.

Another advantage is the available amount of space for window display and sign boards, the principal street serving as front with more windows, the other street with its extra burden of signs.

One more point is the greater field for patronage by reason of the more roads leading to the Rome of your ambition. At all times lay much stress on the shape of your store as an aid to location.

I would not make a plea for all druggists to rush for such locations, for I believe every man will enjoy more comfort if his store has four good square corners and the floor space allotted to such.



SPONGE WEEK AT H. H. HAY & SON'S, PORTLAND, ME.—THE WINDOW.

To those who have been so fortunate or unfortunate, as to cast their lot on a triangle, the following description of our store, though not a model in arrangement, may prove of interest. This store was fitted for its present use some forty years ago and has since had little of the radical change that would make it a model modern store. Still it serves its purpose to a fair degree and fulfils the needs as well as many more expensively equipped establishments.

In the arrangement shown in the diagram, there would at first seem to be little of the order usually observed in a pharmacy. On a second look you will see that the soda counter and cigar case are convenient to the doors and as remote from the prescription counter as possible. The prescription counter is partly screened by the brush cases in front and still is accessible to those necessary adjuncts, the sink room, the pill and chemical cases, and has a fine light from the show

window at the side. In the sink room will be noticed a dumb waiter. This communicates with the laboratory above and the cellar below, giving ready access to those important bases of supply.

The other corner is given over to general dispensing of drugs, perfumes and sundries. The patent medicine stock is mostly above the shelf ware, around the whole store, thus utilizing this waste space. The cramped quarters make thorough display of goods impossible, but this is in a measure compensated for by a systematic and seasonable weekly rotation of window displays. One of the recent attempts in this line was two weeks devoted to sponges. The illustrations give a good idea of the general effect, but a few words may make clearer the subject.

SPONGE WEEK AT H. H. HAYS & SON'S, PORTLAND, ME.—INTERIOR.

The first window contained some sea curiosities such as sea fans, sea ferns, corals, shells, loofahs and small toilet sponges. The last two were festooned and draped above the following sign, helping to attract attention:

FLOWERS
From Neptune's Garden.

The next window was devoted to the better grade of bath sponges and bathing brushes, sponge bags and bathers' supplies.

The third window contained the bargain grades of sponges marked in dry goods store style, the price being in odd numbers and conspicuous. A tank of gold fish here offered an attraction to the indifferent passer.

The large end window was devoted to carriage and stable sponges and chamois, the unbleached and tougher sorts.

The inside of the store was festooned with sponges and in fact it was very suggestive of the sea for a time.

Our advertisements in the papers in the meantime dwelt on the same theme, with a change at the end of the week and a reading notice at the same time, calling the attention of the public to the display.

Sponge week was followed by soap week, all windows bearing that article classified in a similar way.

1. The several varieties of castile soaps.
2. The fine toilet soaps.
3. 5 cent and 10 cent varieties of the bargain sort.
4. Medicinal and disinfecting soaps.

A thorough display of one article at a time seems to impress the public and leads to a steady demand for the articles shown, even when withdrawn from prominence.

Trusting some other dispensers in three-cornered stores may find comfort in our sympathy for them, we shall hope to hear of their success in drawing attention of the drug-seeking public to their abodes.

Written for the American Druggist and Pharmaceutical Record.

Pharmacal Advertising.

By Wm. B. Lillard.

In my several articles as to the profits in the retail drug business, I found in collecting statistics for the information in them, the same story was told by nearly every pharmacist, "that there was no way to increase the regular drug business, it was surely regulated by the demand, that the public would not buy medicine, no matter at what price it was sold, except it was wanted for immediate use." But after a careful investigation I found that the average drug store sold nearly half its goods by the advertisements of the manufacturers. If the pharmacist by distributing the advertising matter for the various wholesale makers creates a business for them as well as for himself, why would it not pay him to create a business for himself without giving the larger per cent. of the profits to others? I don't mean that I would suggest that he put up or have put up for him a full line of patents, but keep and advertise his novelties in the sundry department. No department of the business pays as good a profit, yet the average sale of sundries will not equal 12 per cent. of the actual business. If there is any way to increase the only part of the business which is profitable, surely advertising will do it. There are so many different ways of advertising that each one will have to be guided by his own judgment. There is no reason why novelties in advertising should not be successfully carried out by the pharmacist. Among the several novelties in pharmacal advertisements, and quite successful ones, was the one of Messrs. Sorrells & Carr. I suggested the idea and have never heard of its being used by any other firm.

The original was without the cut.

MESSRS. SORRELLS & CARR,

OF THE

PARLOR DRUG STORE

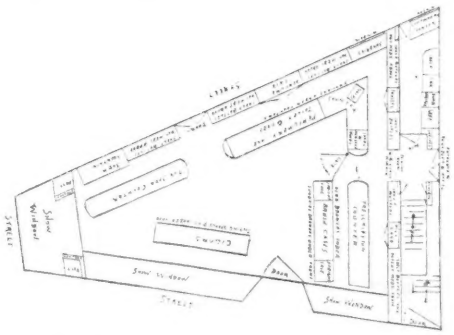
Want every Little Girl in the city to bring her Doll to the Parlor Drug Store, between August 15 and September 1. The dolls to be placed in the store window on exhibition, and to stay for one week after September 1.

They will give a cash prize of Five Dollars to the prettiest dressed doll. To the second, Three Dollars; to the third, Two Dollars; and to the fourth, One Dollar.

For the first hundred Dolls brought to the store, they will give a bottle of perfume free to each little girl.

No names must be placed on the dolls in any way, as each Doll will be numbered and a corresponding number will be given to the owner of the Doll. So there will be no trouble for each owner to get her doll.

On September 7, the Prizes will be awarded, and the Dolls winning the prizes must stay until September 15.



PLAN OF THE THREE-CORNERED DRUG STORE. OF H. H. HAY & SON, PORTLAND, ME.

3 POINTS

for a SPONGE buyer to regard.

APPEARANCE
DURABILITY
PRICE

We can satisfy you on all three.

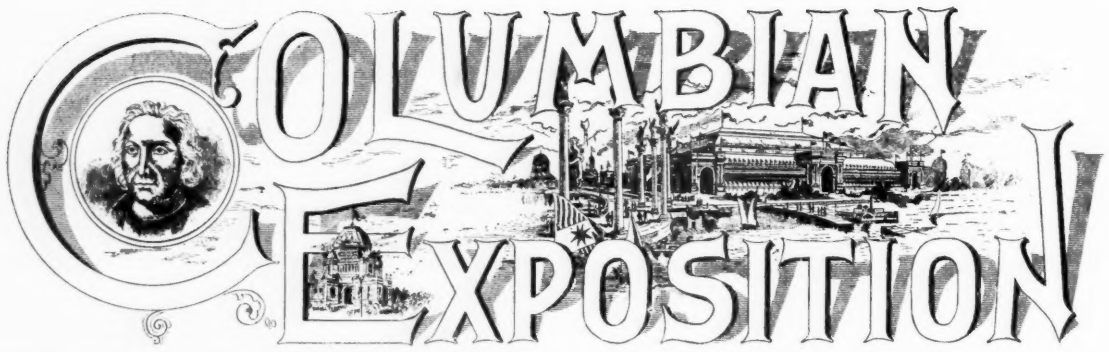
H. H. HAY & SON,

Middle Street.

Sponge Week.

Every year at about this season, when the dust is beginning to fly, H. H. Hay & Son make it their custom to show what their sponge stock is like. Everyone should be interested in this universal agent of cleanliness, as it may be seen in their windows just now.
A "Reader."

Another plan would be to ask for original designs in sachet bags, and offer a reasonable remuneration for the designs selected. Window displays are good mediums also.



Notes of General Interest.

(From our Special Correspondent.)

So much has been said and written in the newspapers and elsewhere of the grand Exposition holding sway at the inland commercial center of this country that but little remains for trade and professional journals except to mention and describe those exhibits of special interest to their clientele.

Inasmuch as many persons will visit Chicago who are utter or comparative strangers to "the city by the lake," a few words with reference to the city and to the Fair in general will not be amiss. All who intend visiting the Fair should decide at once when they will go, how long they will remain, and how many will accompany them, and then should immediately make arrangements accordingly either through the AMERICAN DRUGGIST World's Fair Club, or with some one located in Chicago, a personal friend, or some pharmacist who will do this service gratis, as Henry Biroth, local secretary of the American Pharmaceutical Association, at the Schiller Building, or C. H. Bangs, at the Merck Building, in the World's Fair grounds. Good rooms may be had at as low a price as $1.00 per person per day.

ACCOMODATIONS.

The quarters chosen should be selected in that district known as the "south side," or in Englewood, Hyde Park, Grand Crossing or even in South Chicago. All of these localities connect easily with the Exposition grounds by means of boats plying in Lake Michigan, by elevated, cable and electric cars, and are now so plentifully supplied with hotels that apartments can be secured without any difficulty whatever. As stated, however, it is advisable to secure quarters in advance for a certain specified period and to pay a deposit, obtaining therefor a receipt indicating exactly the period for which the apartments are rented.

Meals may be obtained both within, and without the Fair grounds, at rates which are quite reasonable for a great city.

THE FIRST GLIMPSE.

From whatever direction the visitor approaches the Fair grounds, a number of domes in the distance announce proximity to the Exposition. Of these the tallest as well as the finest is that of the Administration Building. This is beautifully gilded and strung with a great number of incandescents and both day and night immediately commands attention. [See letter E in heading].

The portion of the Exposition which attracts attention at the greatest distance is the great Ferris Wheel, which rises in its oddity to a distance of 260 feet above the ground. The other portion of the Exposition which attracts attention above all other objects is the gigantic Manufactures and Liberal Arts Building, which is one-third of a mile long and about one-half as broad and covers more area than any other single building in the world. In this building are located the principal exhibits of interest to the members of the pharmaceutical profession.

C. O. Rano.

C. O. Rano, who was enthusiastically elected president of the New York State Pharmaceutical Association at the recent meeting at Lakewood, was born in Genesee County in this State in 1848. Mr. Rano is a pharmacist of wide experience, having practiced his calling in New York City, Detroit, Kansas City and Buffalo, where he located permanently in 1872.

Having graduated from the College of Pharmacy of the City of New York, he was in a position to profit by his experience, and when he settled in Buffalo soon took a leading stand among the pharmacists of Erie County. In 1881 he took an active part in the organization of the Erie County Pharmaceutical Association, one of the most efficient and active local organizations of pharmacists in the United States. He has been president of this association several terms.

He was elected Secretary of the Erie County Board of Pharmacy at its organization on May 28, 1884, which office he has continued to fill down to the present to the eminent satisfaction of the pharmacists of that district.

In 1866 Mr. Rano became a member of the A. P. A., and at the last meeting was appointed a member of the committee on trade interests. He has also been chairman of the same committee in the New York State Association for the past two years.

His business career has been prosperous, his social life a success, and his family, embracing a charming wife with children just verging into man and woman hood, is a most interesting one.

With such a leader great things may be hoped for from the State Association.

The other exhibits of special interest to pharmacists are located in the Agricultural, Horticultural, Forestry and Mines and Mining Buildings, while some exhibits of interest are distributed throughout the other buildings and will be described in due course.

The visiting pharmacist will desire to view the products of nature, of the soil, earth and waters, first, and such occur principally, as one would readily suppose, in the Horticultural, Agricultural, Forestry and Mines and Mining Buildings, reserving the manufactured products for the last.

With this plan in mind, the visitor will first enter either the Horticultural or the Agricultural departments. With an eye to the beautiful as well as the useful, he will enter the former.

Horticultural Building.

This building is about 1,000 feet long, divided, as far as the present purpose is concerned, into four parts, beginning at the north end, as follows: Seed, plants, fruits and wines. The building is therefore not devoted exclusively to natural products, but it is best to proceed in the manner specified.

Entering at the north end of the building, the visitor will see an array of exhibits consisting largely of flower seeds. On one side at the extreme north end is a small exhibit of medicinal plant parts by Moser, of Versailles, France. These are in open tin cans with slips of light brown paper upon them bearing the names with some other inscriptions, some of the latter being quite curious. The names of the drugs with the remarks are:

Walnut leaves—highly recommended to ladies; black currant leaves—makes a very good drink; centaury—the tops with flowers; veronica; leaves of pansies; gentian root; absinthe leaves; red vine leaves—used as a tea by ladies of a certain age; pectoral flowers—a mixture; mallow flowers—used as a tea against indigestion; eucalyptus; flowers of linden tree—a good tea for indigestion; scabious; digitalis; ground ivy; matè.

The latter appears in several forms, as a powder, the leaves somewhat broken, and also broken into rather fine particles. More attention is paid to it and a little notice over the container reads as follows:

Matè or Brazilian tea; has been adopted by the blue cross temperance society as a daily drink; also used by the French army; is used for preparing cordials, ice cream, custards, candies, etc.

Just above the open container is a hide bag packed with the drug, this being the manner in which the latter is exported from South America. These drugs are fairly good specimens, but unfortunately the exhibit is not artistically displayed

Near the southern end of the seed court is the pavilion of Smith & Painter, of New Jersey, containing various extracts for fountain purposes, viz., sarsaparilla, soluble

CHOCOLAT-MENIER PAVILION AT THE WORLD'S FAIR.

Chocolat-Menier *

has taken every highest award that has been made for Chocolate since 1832: sixty-one years! and to-day **MENIER** manufactures many times more Chocolate than any other firm manufacturing Chocolate in the world.

THE MANAGERS OF THE WORLD'S FAIR

have shown their appreciation and recognition of these facts in giving to **CHOCOLAT-MENIER THE POSITION OF HONOR** in the square surrounded by the *Administration* Building, the Mines and Mining Building, the Machinery Hall, and in front of the Terminal Railroad Station, so that every person entering or leaving the World's Fair Grounds from the railroad must pass the **CHOCOLAT-MENIER** Building.

¶ **CHOCOLAT-MENIER** Pavilion has been designed and arranged as a reception room where all who are entitled to its privileges can meet their friends, make appointments for the trains, coming or going, and have a comfortable and retired place to rest when fatigued with seeing the exhibits in the other buildings.

EVERY ONE who will send name and address and mention the American Druggist and Pharmaceutical Record, will receive a pass, which will, when presented at the **MENIER** Building at any time during the World's Fair, entitle the bearer to all the privileges of this beautiful pavilion and also to a very liberal sample of Chocolat-Menier **FREE.** Address

CHOCOLAT-MENIER,

American Branch, West Broadway and Leonard St., New York City.

ANNUAL SALES, 33,000,000 POUNDS.

essence of lemon, etc., also ruby-nectar—an unfermented grape juice—vanilla sugar raspberry vinegar, pineapple syrup, etc.

Leading south to the central court is a pathway lined with various growing plants, including the curious dwarf trees of Japan, cacti and ferns of all kinds, and palms, but nothing of medicinal importance, excepting the bay tree or *laurus nobilis*.

Again leading south, occur two pathways with an open court between them. Along these pathways are all the common American fruits, the oranges and lemons of California being most prominent. In the open court are growing orange and lemon plants with fruits in various stages of ripeness.

Agricultural Building.

This building is situated across the lagoon from the Horticultural Building and just south of the Manufactures Building. It is divided into sections, A, B, C, D and E which are on the main floor and F, G, H and I in the gallery. The pharmaceutical visitor may, like the writer, be led to go upstairs, where he will soon espy a number of exhibits of interest.

EXHIBITS IN SECTION F.

Durkee & Co., of New York: African and Jamaica ginger, rolls of Ceylon cinnamon, Nepaul and Natal cayenne pods, white and black pepper, long pepper, cloves, limed and unlimed nutmegs, flavoring extracts, and fixed oil of mustard, also branch of nutmeg plant showing fruit entire and also opened so as to expose the kernel and arillus, tapioca in various forms, grated cassava or manioc root which yields tapioca, and the whole root preserved in liquid.

Michigan Carbon Works, of Detroit: ammonium salts, copperas, sodium and potassium sulphate, bone-black, mineral acids, glues of various degrees of purity and of various forms, in whole slabs, broken slabs, and ground, also sheet gelatin, pink and white and ground.

Hayward's Paste Sheep Dip and Liquid Sheep Dip from England.

Pratt Food Co., of Philadelphia, poultry food, dog biscuits and horse and cattle food.

Among the products of Java we find specimens of mace, coriander, tea and coffee from various plantations, also poco oil, a Javanese remedy for headache, neuralgia, etc., to be applied externally, which is put up somewhat like our "patent" medicines, which class it probably belongs to.

Baker Castor Oil Co., of New York: castor beans from Texas, India and Brazil, castor oil in various degrees of purity ranging from the "crystal" to the darker kinds used for lubricating purposes, also camphor in large circular plates, and small rectangular cakes as well as the crude, and a specimen of the wood of the camphor tree.

Wm. Dreydoppel, of Philadelphia, toilet soap manufacturers, have a decidedly unique exhibit made entirely of soap. Upon a circular base about two feet high is mounted a five-pointed star, and above the whole is the figure of Betsy Ross in the act of making the first flag of the United States, the one that was afterwards flung to the breezes from the mast of Paul Jones' ship, the Bon Homme Richard. In the angles of the star are five wreathed plates, four of which are inscribed respectively with the figures 1776, 1812, 1846 and 1861, the dates of the four great wars in which the Union has been engaged. The fifth one bears a representation of the Independence liberty bell. About the base are thirteen rectangular plates inscribed with the names of the original colonies, and upon the base at the edges of the star are five large balls intended to represent cannon balls.

Rumford Chemical Works, of Providence, R. I., Horsford's various preparations including the acid phosphate.

Libby, McNeill & Libby, Chicago, fluid beef and beef extract.

J. Allen Rice

Is a native of Barre, Mass., where he received his early education in the public schools. He then took a course of study at Powers Institute, Bernardston, Mass., and later an actual business course at Eastman's National Business College, Poughkeepsie, N. Y.

He entered the drug business in Milford, Mass., in the year 1870, for a time having a partner, but a fire swept away the building and most of their stock, and shortly after Mr. Rice bought an interest in the land where their store had formerly stood, and in company with their former landlord built a block in which there were three stores, an odd fellows hall, and a number of offices. He then bought his partner's interest in the drug business, fitted up

J. ALLEN RICE.

a fine store in this new block where he has continued in business ever since, and for many years has been pretty well known throughout the trade and by physicians and the public of that section of the State.

In 1884 he organized a local association of the pharmacists of Milford and adjoining towns, which has been of much benefit in bringing about a uniformity in prices of all proprietary medicines and other articles, as well as improving the general friendly feeling of those interested.

The same year he joined the Massachusetts Pharmaceutical Association of which he has been an active and interested member ever since, never having failed to be present at an annual meeting since.

He has often served on important committees, has twice been elected vice-president, and several times been nominated for president, but has modestly withdrawn his name in favor of older men longer in the service whom he considered more entitled to the honor; this time, however, he was the unanimous choice of the convention and has accepted, and the association is to be congratulated upon the result.

We feel that the influence of the M. S. P. A. will grow stronger, and be more and more felt as time goes on under his administration.

Under his direction they may look for one of the most prosperous years in the history of the organization.

In his own town, Mr. Rice is known as a careful, sagacious business man of much energy and push, and has been among the foremost in starting a long list of business enterprises which have made Milford one of the largest and most prosperous towns in Massachusetts to-day.

P. A. Balcom Soap Co., of Denver, Col., "Geyserite," a toilet soap.

Leonard & Ellis, Chicago, lubricating oils.

Ostrom & Lincoln Co., Bridgeport, Conn., various kinds of toilet soaps, olive oil and glycerin.

Bovinine Co., of New York, bovinine.

Nitrate of sodium, the crude salt with its variegated tints, 95 per cent. salt and the pure article.

EXHIBITS IN SECTION G.

Chicago Sugar Refining Co., of Chicago, a large number of products derived directly or indirectly from Indian corn, viz., white and yellow powdered dextrin, lump dextrin almost identical in appearance with a No. 1 gum arabic, liquid glucose in various degrees of purity and density, solid glucose varying from brown to white, and an anhydrous glucose, and corn or maize oil, crude and refined.

Henry Maillard, of New York.—The most noticeable features of this beautiful exhibit are the five figures of heroic size, each weighing about 1,500 pounds, and made of chocolate. Four of the figures are at the corners of the pavilion, each pair representing Venus de Milo and Minerva. The fifth one, situated at one side, represents Columbus. In the exhibit are also to be seen cacao pods cut open so as to show the beans or seeds, also the beans or seeds themselves after "cloying," ground cacao seeds and cacao fat.

Schulze-Berge & Koechl, exhibiting the products of Fahlberg, List & Co., of Germany, saccharin pure and a readily-soluble form (probably an admixture with sodium bicarbonate), which is 275 times as sweet as sugar. Also saccharin tablets, triturations with sugar and various medicinal syrups made with saccharin solution instead of sugar, preserves and biscuits made with saccharin, compound licorice powder made with saccharin trituration instead of sugar, etc.

The Chas. E. Hires Co., of Philadelphia, a beautiful onyx fountain dispensing root beer free to all, also packages of the root beer and root beer extract. In this connection are also large jars of the drugs used in making the beer, rolls of Honduras sarsaparilla, sassafras bark, ginger root, pipsesewa herb, and wintergreen leaves.

Elgin Condensed Milk Co., Elgin, Ill.; condensed cream and milk.

Helvetia Condensed Milk Co., of Highland, Ill., condensed milk and cream.

Matzoon Co., of New York, matzoon, a preparation analogous to kumyss.

Howell Condensed Milk and Cream Co., Goshen, N. Y., evaporated milk.

A great number of brewing firms have exhibits in this section, and among the products shown are a number kept in stock by pharmacists, particularly those in the large cities. In Anheuser-Busch's (of St. Louis) exhibit are bottles, of Liquid Bread manufactured by David Nicholson, of St. Louis.

(To be continued.)

Gillotts Steel Pens.

A superb exhibit of Joseph Gillott's steel pens—the finest exhibition display of such articles ever made—may now be seen at the World's Columbian Exposition, Chicago, in the Building of Manufactures and Liberal Arts—Department H, Group 89.